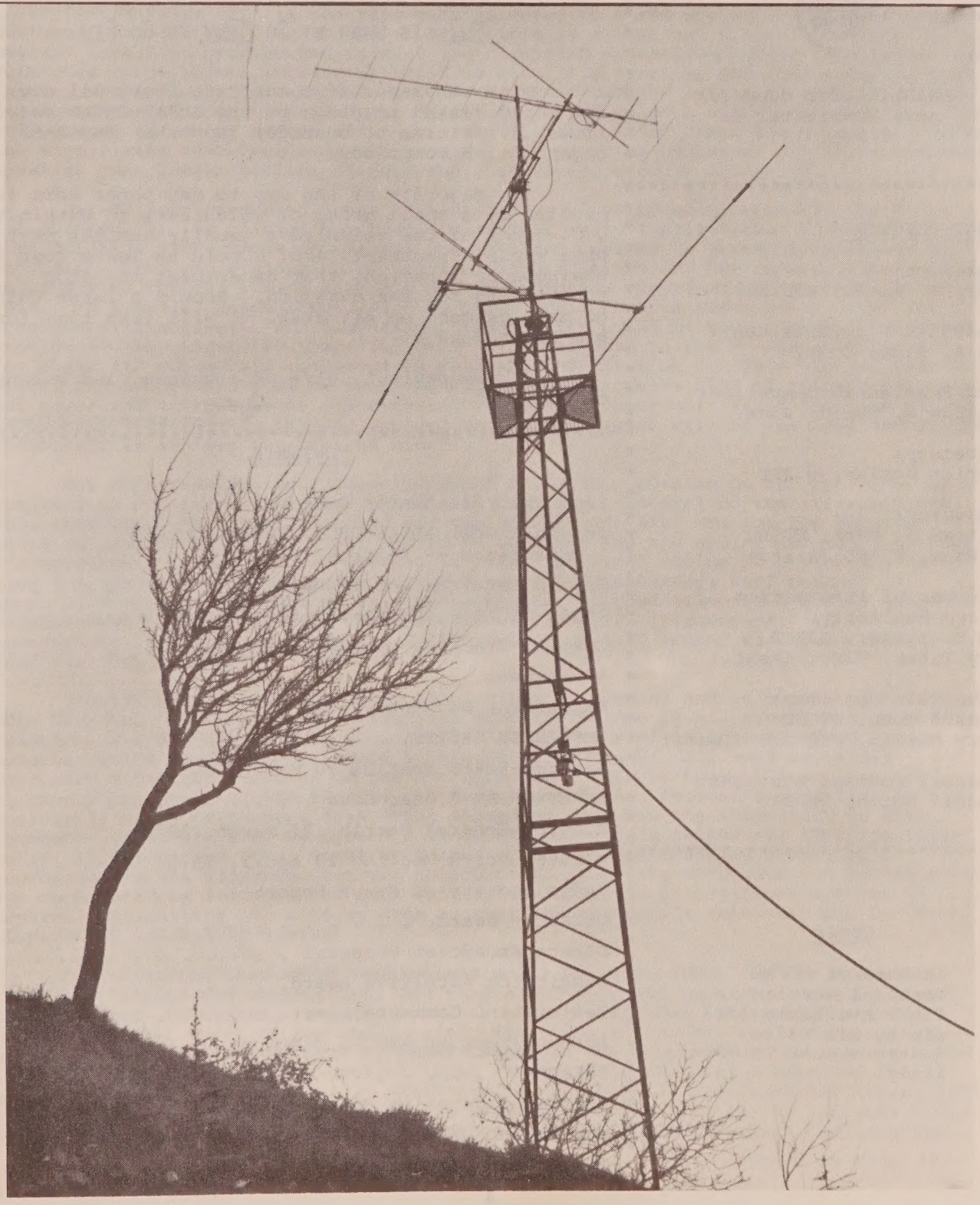
AMSAT™ NEWSLETTER

Affiliated with

Issued quarterly by the Radio Amateur Satellite Corporation

Volume VII Number 2 June 1975 $1.00



AMSAT NEWSLETTER, published by the Radio Amateur Satellite Corporation (AMSAT), with offices at 700 Seventh St. S.W., Apt. 226, Washington, D. C. 20024 U.S.A. Printed in the U.S.A. Please address all correspondence to AMSAT, Box 27, Washington, D. C. 20044 U.S.A.

Telephone: (202) 488-8649

Subscription Price: $6.00 per year, inseparable from $10.00 membership dues.

DEADLINE for copy for next Newsletter is 1 Aug. 1975

Cover

Antenna of OSCAR Terminal station at I3BMV available for use by all radio amateurs near Trieste, Italy.

EDITORIAL

So Much is Owed by So Many to So Few

With thousands of spacecraft users all over the world linked together by the AMSAT-OSCAR satellites, it is time to consider just what the AMSAT organization comprises.

The majority of the day to day paper work is handled by a small group of volunteers in Washington, D.C. Each of the volunteers usually handles part of or a whole department, and, should he leave town on business or vacation, that department may stop functioning for the duration. Should a large volume of mail descend on his desk, it will take time for him to process it.

So, be patient, give us a chance, and volunteer to help out.

Joe

Joe Kasser, Editor

CONTENTS

FROM THE PRESIDENT'S DESK

by Perry Klein, K3JTE

THE AMSAT PHASE III PROGRAM - Results of the AMSAT-OSCAR Experimenters Conference

AMSAT-OSCAR builders from Australia, Canada, Germany, and the East and West Coasts of the United States convened March 20-24 in Washington for the 1975 International AMSAT-OSCAR Experimenters Conference. The purpose of these meetings was to define the next satellites(s) and the responsibilities of the several AMSAT affiliate organizations in developing these spacecraft. Representing WIA-Project Australis was Dave Hull VK3ZDH; from AMSAT-Canada were Larry Kayser VE3QB, Bob Pepper VE2AO, and Ernie Welling VE3HD; Karl Meinzer DJ4ZC attended from AMSAT-Deutschland; Dick Kolbly K6HIJ and Chuck Swedblom WA6EXV travelled from the San Bernardino Microwave Society in California; and Jan King W3GEY, Perry Klein K3JTE and several others of "AMSAT International" attended.

"AMSAT Phase III" is the term used to refer to a new series of AMSAT spacecraft designed for drifting synchronous or high-altitude elliptical orbits. Phase I of the amateur satellite program constituted the flight of short-lived OSCAR satellites that were used to stimulate amateur interest in satellite tracking and communication techniques, while Phase II is represented by the AMSAT-OSCAR-B series of longer-lifetime transponder satellites intended for flight in orbits below 1,000 miles altitude. The new planned series of higher-altitude, long-lifetime AMSAT Phase III spacecraft offer the significant advantage over the previous low-orbiting OSCARs of providing improved coverage over longer periods of time and over vastly greater distances.

Dr. Meinzer presented notes on his studies of orbit considerations for Phase III spacecraft. He pointed out that for amateur radio applications, geostationary or even drifting synchronous satellites are far from optimum in terms of the coverage provided. From the standpoint of users at higher latitudes, far more suitable would be highly elliptical orbits having a near-synchronous apogee occurring over the north pole. In terms of usage times, such an orbit would be five times better than for a synchronous spacecraft, and long-range capabilities would be much improved. The key problem is that about 100 times the EIRP is needed both on the uplink and downlink for Phase III spacecraft as compared with AMSAT-OSCAR 6 or 7. This implies that a stabilized spacecraft will be required with about 100 watts EIRP of transponder output power and antenna gain. Considering the launch opportunities in the time period envisioned (1978-1979), it also appears that a kick motor will be required aboard the spacecraft to achieve the desired orbit.

The Experimenters Conference included a lengthly session on the choice of best frequencies for the transponder uplink and downlink. Several of the experimenters felt that 435.1 MHz should be used for the uplink and 145.9 MHz for the downlink, while others felt that 145.9 MHz should be employed for the uplink and 435.1 MHz for the downlink. It was finally decided to leave the final choice of uplink and downlink frequencies to the designer of the Phase III transponder, Karl Meinzer, especially considering that he is responsible for further spacecraft design tradeoff studies which will affect the final choice of Phase III frequencies. It was agreed, however, to invite the comments of AMSAT members on this matter to obtain inputs from the user community. (See page 8).

Several sessions were held on the subject of command and telemetry spacecraft data handling. The Phase III spacecraft command, telemetry and experiment control functions are all expected to be accomplished by means of an onboard C/MOS microcomputer which can be reprogrammed by ground telecommand. All were certainly impressed with the potential of the microprocessor for the Phase III application. It should be possible, for example, to load commands for automatic execution by the spacecraft hours or perhaps days later depending upon how the spacecraft is programmed. It should also be possible to obtain Morse code telemetry, teletype telemetry, Codestore and other forms of telemetry and stored messages simply by reprogramming the microcomputer via telecommand. The telemetry data can be formatted and commutated as desired, and even transmitted directly in engineering units if desired. Formatting can also be done so that the spacecraft telemetry can be displayed on a television screen.

It was agreed that AMSAT Deutschland would be responsible for the Phase III spacecraft design and engineering, and that AMSAT-DL would turn over working breadboards of each subsystem, one at a time, to AMSAT-Canada for fabrication into an engineering test model of the spacecraft. The first subsystem, the completed telecommand system, was turned over to AMSAT-Canada at the meeting for fabrication. The microcomputer and experiment control logic subsystem is the next portion of the spacecraft slated for transfer to AMSAT-Canada, and this is scheduled for August 1975, followed by the transponder later in the year. Project Australis, at the same time, will begin ground system equipment design and development work, which includes the

(Continued on Page 18)

1975 INTERNATIONAL AMSAT-OSCAR EXPERIMENTERS CONFERENCE

Held at Washington, D.C., March 20-24, 1975

AGENDA

Thursday, March 20, 1975

7-11 PM - Plenary Assembly - AMSAT Phase III Program Approach

Friday, March 21, 1975

9-12 AM - Working Groups - Engineering and Ground System Equipment Groups (Microprocessor data-handling specifications)

12-1 PM - Luncheon with Goddard Space Flight Center AMSAT members

1-5 PM - Working Groups - Engineering and Ground System Equipment Groups (Transponder and command system specifications)

7-11 PM - Plenary Assembly - Orbits and Launch Opportunities

Saturday, March 22, 1975

9-12 AM - Working Groups - Engineering and Ground System Equipment Groups (Microprocessor data-handling specifications)

1-6 PM - Plenary Assembly - AMSAT Phase III Spacecraft Technical Specifications

6-11 PM - AMSAT Dinner and General Meeting (Goddard Recreation Center)

Sunday, March 23, 1975

9-12 AM - Working Groups - Engineering and Ground System Equipment Groups (Transponder and command system specifications)

1-5 PM - Plenary Assembly - AMSAT Phase III Technical Specifications

7-11 PM - Plenary Assembly - Task Assignments, Action Items, Time Schedules, and Resources

REPORT ON THE 1975 INTERNATIONAL AMSAT-OSCAR EXPERIMENTERS CONFERENCE MARCH 1975

By David Hull, VK3ZDH, Chairman, W.I.A. Project Australis

This conference was held at the Goddard Space Flight Center, Greenbelt, Maryland, U.S.A. over the period 20th to 24th March, 1975. It was convened to define the next satellite(s) in the OSCAR series and to decide the responsibilities of the national groups involved towards developing these satellites.

Those who attended included Larry Kayser VE3QB and Bob Pepper VE2AO from AMSAT Canada, Karl Meinzer DJ4ZC from AMSAT Deutschland, Chuck Swedblom WA6EXV and Dick Kolbly K6HIJ from the San Bernardino Microwave Society, Jan King W3GEY and Perry Klein K3JTE from AMSAT HQ and Dave Hull VK3ZDH from the WIA Project Australis.

The principal area of discussion was Oscar 8 and the possible launch vehicle/orbit opportunities for this project. Without going too much into the alternative possibilities, which included a joint VK/VE satellite in an Oscar 6/7 orbit, it can be stated that the conference decided to go ahead on development of an AMSAT Phase III advanced spacecraft for launch in mid-1978 and to concentrate all effort to that end.

The development is constrained by the launch date of the last Itos launch on the Delta 2910, a call-up mission with a mid-1978 target. Failing this launch the Titan 3C/377 Military launch could be considered as could the Space Shuttle scheduled for an expected first launch in June 1979. The orbit possibilities of these launches are

(Continued on Page 5)

(Continued from Page 4)

900 mile, Sun Synchronous (as per Oscar's 6 & 7) for the Delta, Geostationary Synchronous for the Titan, and low altitude low inclination for the Shuttle. None of these orbits was considered entirely satisfactory for the Amateur Satellite service worldwide at our present state of development.

An optimum location for the Geostationary satellite was impossible to find; it would serve only one area for long periods at a time. The 900 mile orbit had been fully explored with Oscars 6 & 7 and there seemed little point to a lower shuttle height orbit. The only alternative seemed to be an initial launch into a 900 mile orbit with a subsequent in-flight manoeuvre to raise the apogee of the satellite to such a height that a considerable radio range would result for much of the orbit.

What the conference had in mind was to provide a viable alternative to the 20 metre band without any of the propagation problems of the HF bands. This in-flight manoeuvre would require the spacecraft to be fitted with an Apogee Kick Motor (an AKM, a small internal rocket motor) and this would be a completely new development for the OSCAR Series. This motor would be fired by ground control some orbits after launch at a time determined by the orbit mechanics. It is anticipated that the AKM will push the satellite into an initial apogee over the North Pole of 7.2 earth radii. About 1000 watts EIRP would be required for effective communication at apogee.

To this end, and to further advance our command techniques, it was decided to fly, also for the first time, an onboard computer. This unit would integrate the Command, Telemetry and general housekeeping of the whole spacecraft. The Computer would interface directly with Ground Station Equipment (GSE) computers in the worldwide chain of command stations. The Spacecraft computer would also arrange the transmission of telemetry in any format (RTTY, CW, BCD et al) as decided by the software fed from the command stations. Commands and operating schedules would also be decided in like manner by ground loaded software.

All this is an interesting technical exercise from the participant point of view, but what about the Oscar users?

The principal transponder would be a linear unit of 150 kHz bandwidth with reception either in the 2 m or 70 cm band and transmission in the alternative (70 cm or 2 m band). The exact choice of uplink, 2 m or 70 cm, and thus downlink, was not decided and the conference chose to refer this choice to a poll of interested parties.

In general, VE and VK with some of the W's favoured 2 m up and 70 cm down; the DJ and AMSAT HQ representatives were in favour of the alternative (as in Oscar 7).

Two or three Beacons will be flown. There will be a beacon at each end of the passband and, possibly, a 2304 MHz beacon if the present problem with the FCC on this question can be overcome.

The responsibilities of the groups involved in building the spacecraft were laid down as follows:

AMSAT Deutschland:	Design major units of spacecraft, i.e., transponder, integrated housekeeping unit including computer. Build prototype spacecraft.
AMSAT Canada:	Build spacecraft,both prototype and flight units.
Project Australis:	Design and build GSE equipment with ground computer etc., provide prototype for test use and 5 - 6 integrated units for world command stations before launch. Provide software for both spacecraft and GSE computers.
San Bernardino Microwave Society:	Design and build 2304 MHz beacon.
AMSAT HQ:	Provide overall system management, procure components, arrange launch, provide operations management once spacecraft is in orbit.

As will be seen this is an ambitious program and is, of course, subject to future changes and modifications as circumstances may demand. The planned spacecraft is, however, a logical expansion of the AMSAT-OSCAR program and we believe

(Continued on Page 6)

(Continued from Page 5)

within the capabilities of the international participants given reasonable fortune and support.

On a personal note I would like to thank sincerely Larry Kayser VE3QB, Perry Klein K3JTE, Tom Clark WA3LND and Jan King W3GEY amongst many others who made the author so welcome and provided the hospitality for which the W and VE amateurs are so well known. In addition, I would like to thank the Executive and Divisions of the W.I.A. whose faith in Project Australis and the Oscar program made my trip possible. I hope the end justifies the means.

VK3ZDH

ACTION ITEMS (AMSAT PHASE III PROJECT)-

FROM THE 1975 INTERNATIONAL AMSAT-OSCAR EXPERIMENTERS CONFERENCE

April 8, 1975

I. Action Items - AMSAT Deutschland

Due Date		
July 1, 1975	A)	Perform Phase III spacecraft tradeoff study leading to system design, and report recommendations to AMSAT Hdq. (Mechanical design should include lifting points on the structure, a method of lifting the spacecraft, and a method of fastening solar panel protective covers. Use metric and English units in drawings, and size screw holes to accommodate either metric or English hardware sizes. Use aluminum for the structure and stainless steel for hardware.)
July 1, 1975	B)	Perform study of Phase III spacecraft failure modes and the use of redundancy, and report recommendations to AMSAT Hdq.
July 1, 1975	C)	Study effects of radiation environment on Phase III spacecraft in elliptical orbits of different inclinations and altitudes, and report results (jointly with AMSAT Hdq.)
July 1, 1975	D)	Provide envelope drawing of Phase III spacecraft (jointly with AMSAT Hdq.)
July 1, 1975	E)	Prepare Phase III command system circuit description for AMSAT Hdq. (This is in addition to the command system standard writeup already furnished.)
Aug. 1, 1975	F)	Prepare Phase III microcomputer circuit description for AMSAT Hdq.
Aug. 1, 1975	G)	Develop breadboard of microcomputer and experiment control logic portions of integrated telemetry and command subsystem, and turn over to AMSAT-Canada with full documentation.
Dec. 31, 1975	H)	Prepare Preliminary Design Document describing the proposed spacecraft design from the systems standpoint first, and then briefly discuss the design of each subsystem, explaining tradeoffs where they exist.
as required	I)	Supply RCA plastic COS/MOS integrated circuits as needed to Australis.
immediately	J)	Furnish detailed finished schematic of command system to AMSAT-Canada.
July 1, 1975	K)	Provide recommendations on choice of uplink and downlink frequencies.

(Continued on Page 7)

(Continued from Page 6)

II. Action Items - AMSAT Canada

Due Date		
immediately	A)	Obtain additional sets of documentation on COSMAC microprocessors from RCA for AMSAT Hdq. Check on availability of COSMAC simulator.
July 1, 1975	B)	Repackage Phase III spacecraft telecommand system, and fabricate an engineering test unit. Return telecommand breadboard and engineering test unit to AMSAT-DL, along with the ground command encoder.
immediately	C)	Furnish list of materials available in Canada (such as sheet metals, with thicknesses) to AMSAT-DL.
as required	D)	Supply crystals as needed to AMSAT-DL.
as required	E)	Furnish list of components needed to AMSAT Hdq.
Dec. 31, 1975	F)	Repackage microcomputer and experiment control logic portions of integrated telemetry and command subsystem, and fabricate an engineering test unit. Return breadboard and engineering test unit to AMSAT-DL.

III. Action Items - AMSAT Hdq.

Due Date		
July 1, 1975	A)	Arrange donation of apogee motor (Thiokol - Elkton Div.)
June Newsltr.	B)	Poll AMSAT members on choice of Phase III uplink and downlink frequencies.
July 1, 1975	C)	Provide envelope drawing of Phase III spacecraft (jointly with AMSAT-DL).
July 1, 1975	D)	Locate suitable solar panels or solar cells for Phase III spacecraft. (Try Heliotech, investigate NRL, and explore possibility of assembling solar arrays at RCA Astro-Electronics Div. Contact Lance Ginner for honeycomb material. Also investigate Goddard, APL and Lockheed sources.)
Aug. 1, 1975	E)	Prepare Phase III Spacecraft Specification, completely defining spacecraft performance parameters and responsibilities of the participating groups.
July 1, 1975	F)	Prepare a format document specifying Phase III reports and documentation needed (include size of drawings, etc.)
as required	G)	Furnish:
as required		Fasteners as needed to AMSAT-DL and AMSAT-Canada.
as required		Transistors and integrated circuits as needed to AMSAT-Canada and AMSAT-DL.
immediately		C/MOS random access memories to AMSAT-DL.
July 1, 1975	H)	Investigate computer simulation of radiation environment for elliptical orbits of different inclinations and altitudes and report results. (See also Item I-C).
May 1, 1975	I)	Furnish AMSAT-DL with information on the stability of various highly elliptical orbits.

IV. Action Items - Australis

Due Date		
July 1, 1975	A)	Perform study of Phase III ground system requirements, and report recommendations on hardware configuration to AMSAT Hdq. (Base digital logic on COS/MOS IC's compatible with RCA CD4000 series). Include system block diagrams, and describe hardware tradeoffs where they exist. (Continued on Page 8)

(Continued from Page 7)

Due Date		
Dec. 31, 1975	B)	Develop spacecraft verification and checkout software for Phase III COSMAC microcomputer.
July 1, 1975	C)	Begin design of prototype ground system equipment.

V. Action Items - San Bernardino Microwave Society

Due Date		
Aug. 1, 1975	A)	Design a two-watt 2304 MHz beacon for Phase III spacecraft, and report design to AMSAT Hdq. (Limit DC power consumption to five watts).
July 1, 1975	B)	Investigate possible sources of solar panels at JPL, and report to AMSAT Hdq.
complete	C)	Locate 150 kHz crystal filters for Phase III transponder.

INVITATION FOR COMMENTS ON CHOICE OF FREQUENCIES FOR AMSAT PHASE III TRANSPONDERS

In connection with AMSAT's studies of the Phase III spacecraft design, we are considering the merits of using 435 MHz for the transponder uplink and 145.9 MHz for the downlink, versus the use of 145.9 MHz for the uplink and 435 MHz for the downlink.

At the International AMSAT-OSCAR Experimenters Conference held in March, it was agreed to call for comments from AMSAT members on their preference for one of these two choices. Please address your comments to AMSAT, P. O. Box 27, Washington, D.C. 20044, U.S.A. to reach us by July 31, 1975.

Here are some of the points discussed at the Experimenters Conference having a bearing on the choice of uplink and downlink frequencies:

1. Use of 70 cm (435 MHz) up and two meters down will produce downlink signals approximately 5 dB better than if two meters up and 70 cm down is used.

2. Use of 70 cm up and two meters down means there will be no third harmonic problem for the users. If two meters up and 70 cm down is used, a third harmonic 2.7 MHz from the downlink receiving frequency is produced, making monitoring of downlink transmissions by the users difficult without extensive filtering at each user's station.

3. Use of 70 cm up and two meters down places the burden of the third harmonic filtering on the spacecraft design. With the 70 cm-to-2 m transponder in AMSAT-OSCAR 7, the third harmonic is 5.75 MHz away from the uplink frequency. If 435 MHz is used as an uplink for AMSAT Phase III instead of 432 MHz as in AMSAT-OSCAR 7, this will bring the third harmonic only 2.7 MHz away (only 0.6%), causing a spacecraft filtering problem that will require some attention to solve.

4. Use of 70 cm for the uplink would involve the use of an uplink band shared with other services (such as radar) whose occupants are unknown and not within our control. Interference effects from these other sources are unknown. Although radar pulse suppression circuits are evidently effective in the AMSAT-OSCAR 7 432-to-145.95 MHz transponder, the Phase III spacecraft altitudes will be much higher, exposing the uplink receiver to as much as a third of the earth at the same time, with a higher risk of interference.

5. Use of two meters for the downlink makes it easier to receive transmissions from the satellite, and is in keeping with the philosophy of making it "easier to hear than to talk" through the satellite. This has been the case with the AMSAT-OSCAR 6 and 7 transponders, which use lower frequencies for the downlinks and higher frequencies for the uplinks.

6. Use of two meters for the downlink makes it easier to participate in the education program, since two meter receiving equipment is more readily available than 70 cm equipment. It is also thought that two meter FM equipment could possibly

(Continued on Page 9)

(Continued from Page 8)

be used to receive special satellite FM bulletin transmissions (although FM is definitely to be discouraged for general satellite use.)

7. TVI tends to be less for users transmitting on 70 cm as compared with two meters.

8. Use of two meters for the uplink means that the over 3,000 users already equipped to communicate via the two-to-ten meter transponders in AMSAT-OSCAR 6 and 7 can use the AMSAT Phase III transponders, with the addition of a 435 MHz receiving converter (which many users have already for receiving the AMSAT-OSCAR 7 435.1 MHz beacon.) Higher uplink powers (1 KW EIRP, vs. 80-100 watts for A-O-6 and A-O-7) are likely to be required, however.

9. Use of 70 cm for the downlink will generally result in less local noise and QRN than if two meters is used.

10. It is important to make use of the 435-438 MHz amateur satellite band, and it is thought that use of this band for downlinks rather than uplinks results in higher visibility to the use of this band, an important consideration in view of the upcoming 1979 World Administrative Radio Conference.

11. The 435-438 MHz band is not available for amateur transmission in some countries, while the 144-146 MHz band is available for amateur use with few exceptions.

We are often asked: "Why not build satellite transponders using the 50-54 MHz and 220-225 MHz amateur bands?" The reason for not considering these bands is because they are not allocated for amateur use on a worldwide basis. The 50-54 MHz band is used for television broadcasting in Region 1 (Europe and Africa.) The 220-225 MHz band is not available for amateur use outside of Region 2 (North, Central, and South America). It has also been suggested that we use two-to-ten meters for Phase III transponders in the same way we use them in AMSAT-OSCAR 6 and 7. The problem here is that,because of the higher altitudes involved, 100 times as much EIRP would be required for the satellite ten meter downlink, and this would require a spacecraft much too large to fly piggyback.

Again, we welcome your comments on the choice of frequencies for AMSAT Phase III. Be sure to let us know your thoughts before July 31.

Perry Klein, K3JTE

WA4JID MARITIME MOBILE -- TRIP REPORT

Equipment used: KLM Echo 2 -- 10 watts to a 5/8 λ Wave Whip or 7 element Beam, SB303 Receiver, Hustler Vertical (with 20 M. Coil).

Very successful trip. All systems operated as expected. No problems accessing A0-6 or A0-7. It was easier to access A0-7 much of the time believe it or not!! Would have been on more often but had some boat problems that preoccupied my time. Was able to access under sail in ocean on SSB via A0-6, but nobody answered!

Another interesting fact... Even with simple vertical antennas and low power, I was able to get usable signals right to LOS when I was in water with no land to horizon. When there was land around, "birds" had to be about 20° up for access.

Also, I hereby lay claim to first Mobile on a sailboat contacts on A0-6 and A0-7. Also, all equipment was completely battery operated.

WA4JID

Here's antenna setup. 5/8 wave 2 mtr.ant. is on top of sailboat mast. Beam left side,HF Hustler right.
KEYS TRIP 1 to 6 April, 1975 WA4JID

AMSAT-OSCAR 6/7 ORBITAL DATA CALENDAR

In cooperation with AMSAT, Skip Reymann W6PAJ has published an AMSAT-OSCAR Orbital data calendar containing all orbits for 1975 for both spacecraft designed so that it may be hung on a wall. It includes information on the operating schedules and frequencies for both spacecraft, and also the telemetry decoding equations.

Also included is step-by-step information on how to determine times of passage of the satellites.

It is available post paid for U.S. $3.00 (or 20 IRC's). Overseas orders will be shipped by air mail. Payment should be made to Skip Reymann W6PAJ, P.O. Box 374, San Dimas, California 91773 U.S.A.

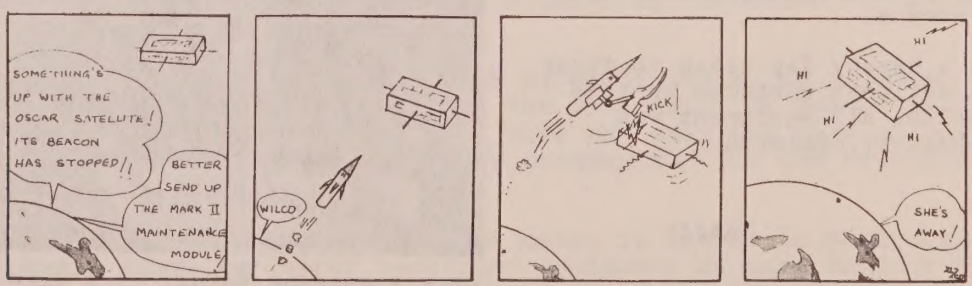
All excess receipts over cost will be donated to the Amateur Space Program.

AMSAT GRATEFULLY ACKNOWLEDGES DONATIONS OF $50.00 OR MORE FROM THE FOLLOWING NEW LIFE MEMBERS

LM-271 Lewis Roberts, VO1CI
LM-272 Thomas Adcock, WB4RSA
LM-273 Tomo Hayami, JA1NEZ
LM-274 Yutaka Matsuzaka, JA1ATL
LM-275 Shigetake Morimoto, JA1NET
LM-276 Kenneth L. Joseph, W4SIG
LM-277 J. Berden, G3RND/G6AAR-T
LM-278 Bud Smith, W2LFL
LM-279 Peter Hammer, VK3ZPI
LM-280 Joseph J. Schroeder, W9JUV
LM-281 E. A. Welling, VE3HD
LM-282 R. C. Allen, W5SXD
LM-283 C. E. Charles, WN2TUA
LM-284 John H. Boston, WB4RUA
LM-285 Allen R. Shuff, W6RTO
LM-286 Dr. Stephen H. Cruse, K3WHC
LM-287 Roy O. Hill, Jr., W4PID
LM-288 Harry S. Gartsman, W6ATC
LM-289 Michael Gazy, W2FND
LM-290 Stuart Paley, 4W1ED/GD3XAX
LM-291 Edward G. Tiedemann, WB4RVA
LM-292 Daniel Sullivan, K4GRI
LM-293 Luc Hoorelbeke, ON6HR
LM-294 Hugh Turnbull, W3ABC
LM-295 J. M. Cutshaw, WB6OJN
LM-296 Robert K. Curtis, K2RLW
LM-297 Walter H. Endlich, PAØGJA/DL9GJ
LM-298 Roy D. Rosner, K2KHR/4,WB4UOX
LM-299 Eugen Merz, HB9MER
LM-300 R. L. Martin, WØQZB/3
LM-301 Harold E. Taylor
LM-302 Val Lavender, VE7VL
LM-303 Robert W. Balcom, W3PZK
LM-304 W. C. Speen, WA5QVD
LM-305 Michele Senestro, I1TEX
LM-306 Scott Moore, WB4FNN
LM-307 Isamu Kobayashi, JAØAD
LM-308 Ikuo Ishii, JAØAIF
LM-309 W. H. Faulkner, Jr., W4DO
LM-310 Ronald Smith, K6GZA
LM-311 R. V. Galle, VK5QR
LM-312 J. W. Dunn, W8UWA
LM-313 Alan E. Frisbie, WB6UYQ/8
LM-314 Bruce Shearer, WA4DYL
LM-315 John W. Sikora, WB9IWN
LM-316 Pietro Fanchin, I1CDB
LM-317 H. A. A. Grimbergen, PAØLQ
LM-318 Robert G. McArthur, WB5MSU
LM-319 Malcolm A. Allison, ZL1TAA
LM-320 G. A. G. Peat, VE6IP
LM-321 D. S. McDougall, W9IV
LM-322 D. H. Solley, VE6YZ
LM-323 R. M. Isaacs, G8CSI
LM-324 Alan M. Chedester, WA3PIC
LM-325 Richard H. Pierce, K3MWV
LM-326 G. R. Kurzenabe, K3SWZ

AMSAT GRATEFULLY ACKNOWLEDGES DONATIONS FROM THE FOLLOWING NEW LIFE MEMBER SOCIETIES

LMS-10 Goddard Amateur Radio Club
LMS-11 Christchurch Branch, New Zealand Association of Radio Transmitters
LMS-12 New Zealand Association of Radio Transmitters



Break In, Jan/Feb, 1975
(New Zealand)

AMSAT-OSCAR 6 Spacecraft Determination of Tumble Rate

by Robert E. Crumrine, WB2DNN

SUMMARY

In the study of solar panel telemetry data from over twenty orbits of Oscar 6, the following things have been determined:

1) The -X panel faces north, +X faces south.

2) The two meter antenna is on the far side of the satellite in the northern hemisphere.

3) The dip angle of the satellite (and the earth's magnetic field) is very high at mid latitudes: 74° @ 40°N. Latitude.

4) Earth illumination of the solar panels is minor.

5) Moon illumination of the solar panels is negligable.

The behavior of the solar panel currents was consistent enough during these orbits to warrant issuing this report.

STABILIZATION BY THE MAIN BAR MAGNET

The satellite is making only two revolutions per orbit, flipping over at the poles, as expected. The -X panel is facing north, and the +X panel (the two meter antenna) is facing south. This is somewhat unexpected.

During evening orbits, the +X face is virtually never sunlit, summer or winter! The -X face is usually sunlit during evening orbits, until Oscar gets close to the north magnetic pole, when both faces are dark. During morning passes, the reverse is true: +X is strongly sunlit and while -X is receiving only earth illumination. The result is that the two meter antenna, mounted on the +X panel is pointing away from the earth in the northern hemisphere.

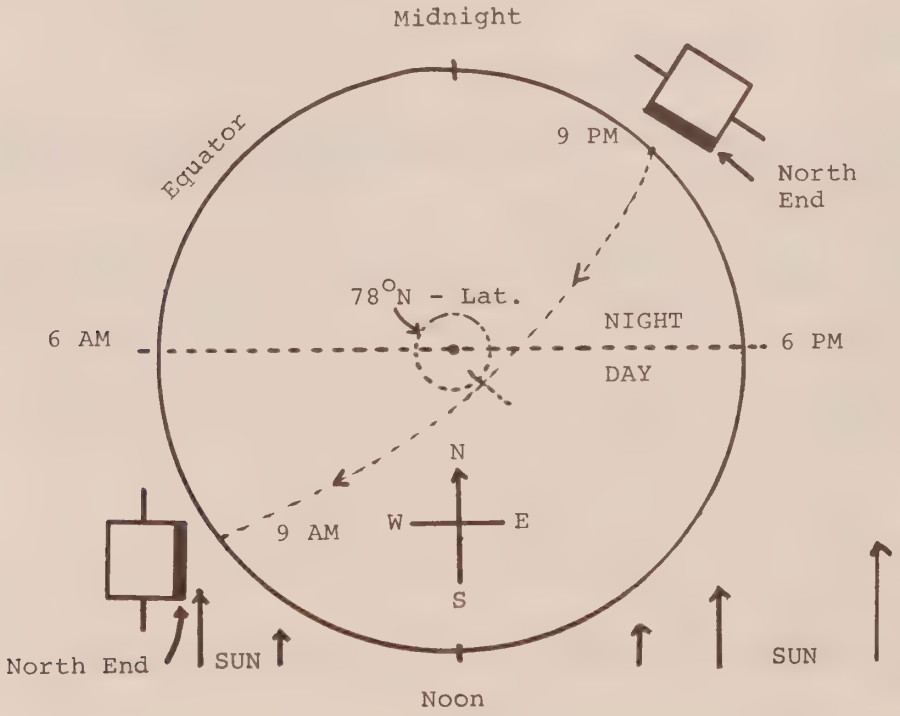


Figure 1 -- Orbit of OSCAR 6 as seen from over the North Pole.
Rotation of Earth not taken into account.

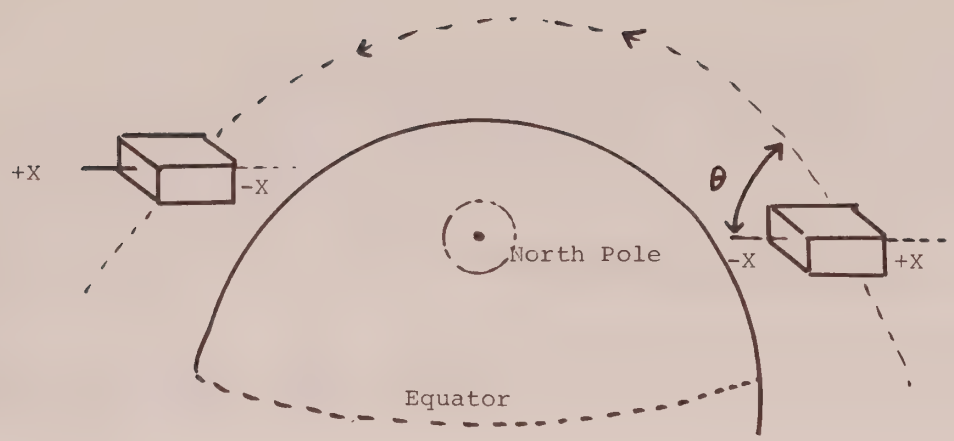


Figure 2 -- OSCAR 6 and orbit as seen by the sun.
Summer Solstice.

The series of drawings in Figures 1, 2, and 3 should help illustrate this motion. Figure 1 shows the northern half of the orbit. Oscar moves toward the sun as well as to the west. Figure 2 shows the earth and satellite orbit as seen by the sun on June 21. Notice that the sun always sees the leading end of the satellite (in the northern hemisphere). That is, in the evening, the north end should be lit, and in the morning, the south end should be sunlit. Figure 3 shows the same thing for December 21. Note that the leading end is still sunlit, i.e., the orbit (as seen by the sun) does not get tipped enough for the sun to illuminate the trailing end. The telemetry shows that, during the evening orbits, the -X panel is sunlit so this must be the north face. In the morning, +X is lit so this must be the south face.

The satellite is flipping over only twice during the orbit. Because of the presence of the bar magnet, Oscar must flip an even number of times during an orbit. If it were flipping four times (i.e.,tumbling four revolutions per orbit), it would have to be turning 360 degrees in 28.5 minutes (¼ orbit) or 180° in 14.25 minutes. On evening passes, then, the sunlit end would have to switch from -X to +X or visa versa in a 14 minute interval, but this has not been observed. The longest telemetry run is 15 minutes.

EFFECT OF OTHER SOURCES OF ILLUMINATION

Earth Illumination:

The effect of earth illumination is minor; panels facing nearly squarely at the sunlit earth show a current count of only 88 or so. This compares with 95 for a dark panel and 50 for a fully sun illuminated panel.

A striking example of earth illumination took place on the solar panel telemetry graph of orbit 6573, which is a morning orbit. Here, the +X count varied a maximum current count of 55 to a minimum of 75 over a 10 minute interval. The -X panel current slowly decreases from count 87 to count 91 over the same time interval. At the beginning of the time interval, 1449^{10} GMT, Oscar is at about 50° north latitude. It can be shown that at this latitude, the north end of the satellite is dipped down at an 83 degree angle, looking almost squarely at the fully sunlit earth below. There is a count of only 87 on the -X panel but at the same time the +X count is 57, almost fully sunlit. There is little change during the rest of the interval.

During evening passes, the earth below the satellite is dark, except for a crescent in the northwest. Therefore, no earth illumination effects can be observed on the solar panels during evening passes.

The same effect does not appear to show up on the Z panels, however. At no time, during the orbits studied for this report, were both Z panels lit at the same time, i.e.,counts below 90.

Illumination from the Moon:

The effect of moonlight is negligible. The moon's astronomical apparent magnitude is -12.6 at full moon while that of the sun is -26, more than 12 magnitudes brighter. The brightness ratio of one stellar magnitude is, by definition, 4 dB, or about 2.5 (Observers Handbook, Royal Astronomical Society of Canada, Univ. of Toronto Press, 1969). The sun, then, is more than 48 dB brighter than the moon, so we can safely ignore solar panel currents generated by moonlight.

SPIN RATE STABILIZATION

With the data collected so far, it is not possible to determine a specific, constant spin rate. Instead, it seems to vary over a wide range. In the 20 or 50 plots examined, spin period have been observed between 2.5 minutes (orbit 6573) and 10 minutes (orbit 6228) or more. Since the sun has been shown to be the only significant source of illumination, there is every reason to believe that the data is valid. However, no ideas come to mind to explain the variation in spin rate.

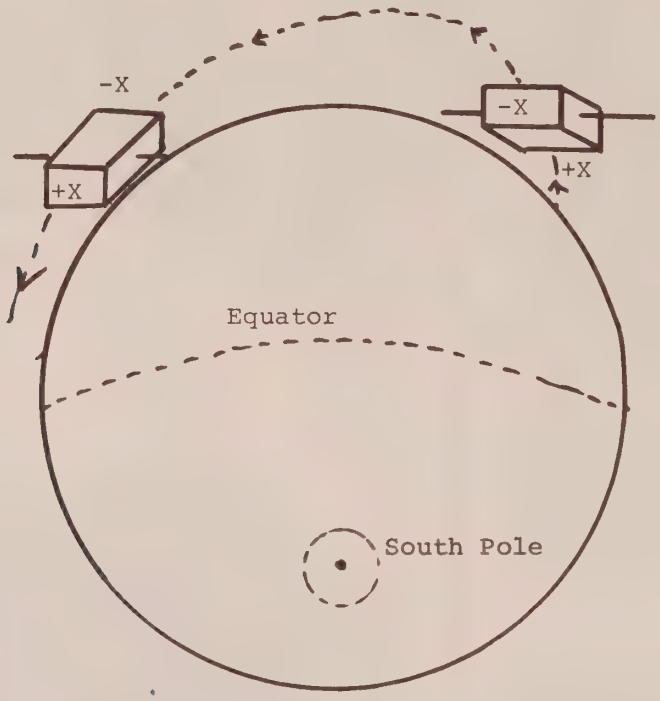


Figure 3 -- OSCAR 6 and orbit as seen by the sun.
Winter Solstice

HELP WANTED

CAN YOU HELP? Please contact AMSAT, P. O. Box 27, Washington, D.C. 20044 if you can assist in any of the following areas:

- Modify 144 MHz and 450 MHz equipment for use on 145.9 and 432.1 MHz with AMSAT-OSCAR 6 and 7. (This equipment is to be used as loaner equipment.)

- Assemble portable OSCAR user terminals for deployment in a disaster zone in the event of an emergency.

- Shipping of loaner equipments for short-term use in various parts of the world. (We have a dozen Skyphones for Mode B use and two Ameco TX-62's for Mode A, but need a volunteer to handle the shipping and any maintenance required.)

- Ordering of components as required for the Phase III spacecraft project. (Integrated circuits, transistors, resistors, capacitors, etc.)

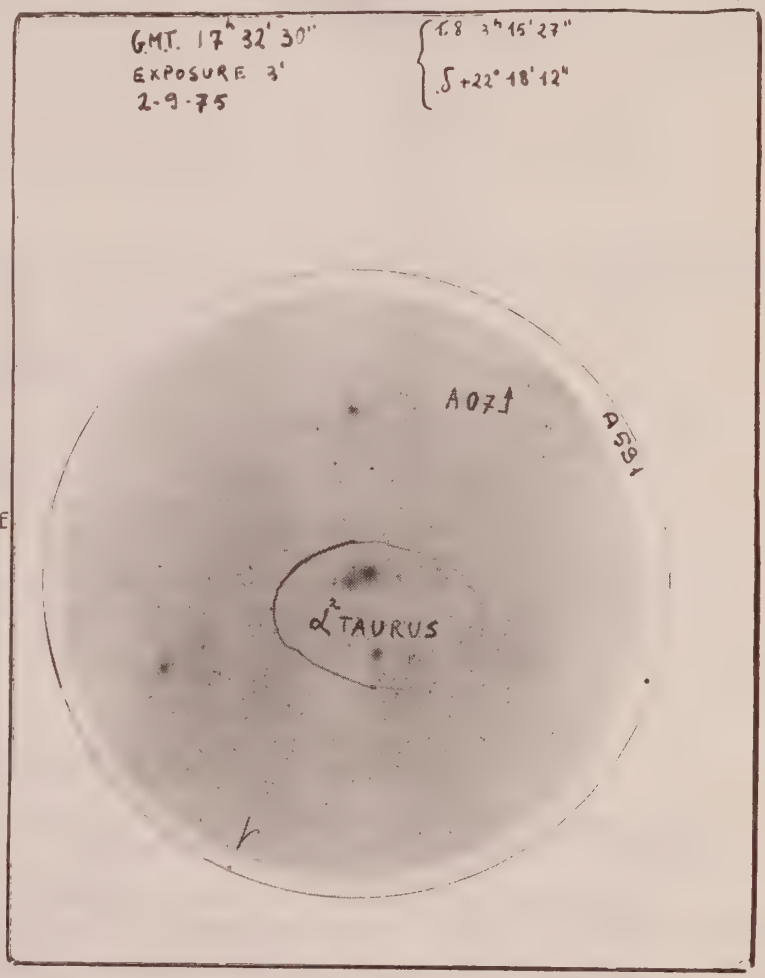
- Donation or long term use of Disk drive suitable for Nova minicomputer... Contact VE3QB direct.

- Help in Programming Microprocessors in sophisticated environment for control of AMSAT-OSCAR's 6 and 7 and in conjunction with the Phase III spacecraft. Contact VE3QB.

OPTICAL TRACKING OF AMSAT OSCAR 7

I3LDS sent AMSAT a picture taken by Sr. Roberto Mosele with his telescope. Dr. Will Webster, WB2TNC, took a look at the picture to see what information on the stability of OSCAR 7 might be obtained from it.

First the coordinates of the satellite during the pass in question were calculated. Next, he identified the star field shown in the picture and verified that the satellite was within the view of the telescope at the time in question. Then he read the stellar brightness off the Smithsonian Astrophysical Observatory Atlas charts. By using an astronomican technique called 'Fly-Spanking Photometry', he measured the astronomical magnitude of A-O-7. It turned out to be 7.5 ±.75. Although the print is of good quality, past experience suggests that image density comparisons from second generation copies can only be measured to an accuracy of 3/4 magnitude at best. The calculations of the orbital track suggest that the satellite was within the field of view of the telescope for about 45 seconds or so. As a result, the differential reciprocity effect might amount to an increase of possibly a half a magnitude between the stellar brightness scale and the satellite. Thus is it possible that the satellite is 7.0 ±.75 but without more information we can't say for sure.



One of the most important questions that can be addressed by means of this picture is the 'quality' of the satellite stabilization system. Although the telemetry system suggests that the stabilization system is behaving well, it is important to check this by direct means. To make this check, he traced the OSCAR 7 track with a photometer to measure fluctuations in the image brightness. He found that there is less than 2% variation in the image brightness along the track. As the satellite is almost entirely covered with solar cells, this translates to less than a two percent variation in the optical cross section of the satellite over the time the satellite was in the field of view. Thus we can eliminate any very quick motions along any but the major axis of the satellite. It looks like the satellite stabilization is OK.

Further pictures, perhaps with a wider field of view would be of great interest in nailing down the longer period motions of the satellite. Similarly, we might be able to get some good information on OSCAR 6 from suitable pictures.

PHOTOS OF AMSAT-OSCAR 7 NOW AVAILABLE

Eight by ten-inch full-color photographs of AMSAT-OSCAR 7 (artist's conception in space with the Earth as a background) are now available for $3.00 U.S. (or 20 IRC's) postpaid from:

Alan L. Bridges, WB4VXP
VHF Communications South
2881 South Main Street
Kennesaw, Georgia 30144, U.S.A.

Please make your check or money order payable to AMSAT, who will receive the proceeds.

AMSAT NETS

The following AMSAT Nets meet regularly to disseminate information to newcomers and to keep regular satellite users in communication with one another.

USA-East Coast Net	Tuesdays	9:00PM EDT	3850kHz LSB	Net Control W3ZM
USA-Mid States Net	Tuesdays	9:00PM CDT	7280kHz LSB	Net Control WØCY
USA-West Coast Net	Tuesdays	8:00PM PDT	3850kHz LSB	Net Control W6CG
JA-Net	Mondays	1300 Z	3560kHz LSB	Net Control JA1ANG
ZL-Net	Mon,Th,Sat	1900 Local	3850kHz LSB	Net Control ZL1WB
South-East Asia Net	Thursdays	1300 Z	14,320kHz USB	Net Control JA1ANG
Western Europe Net	Saturdays	1000 Z	14,280kHz USB	Net Control G3IOR
	Sundays	1015 Local	3780kHz LSB	Net Control G3RWL
International Net	Sundays	1800 Z	14,280kHz USB	Net Control W3ZM
	Sundays	1900 Z	21,280kHz USB	Net Control W3ZM
Africa-Europe Net	Sundays	1730 Z	14,280kHz USB	Net Control G3IOR

The following vhf frequencies are also in use:

London, England	144.28MHz FM	Net Control G8CSI	Sundays	1930 Z
Washington, D.C.	146.25-85MHz FM	WR3ABU	Daily	--
Southern California	146.25-85MHz FM	WR6ACJ	Daily	--
Tacoma, Wash.	146.04-64MHz FM	Net Control WA7FVT	Mondays	1900 PDT

Bulletins of general interest to those interested in amateur satellites are transmitted regularly on OSCAR-6 reference orbits, at approximately 10 minutes after Ascending Node. These bulletins are transmitted on a Downlink Frequency of approximately 29,490 kHz and can be received over most of Eastern North America.

Readers are requested to inform AMSAT about any corrections or changes to the above net schedules.

EXPERIMENT DAY ACTIVITIES

During the summer months AMSAT plans to conduct tests on Mode B experiment days (and other selected periods that will be announced via the AMSAT Nets) involving low power transmissions from remotely located platforms. The concept involves placing a telemetry system and a small transmitter in an isolated area for the collection and transmission of environmental data. The test transmissions will involve equipment with ERP's in the range 1 to 10 Watts. In order for these transmissions to be effective a clear passband will be required. At powers as low as one watt any other station of greater signal strength within the passband will activate the AGC and spoil the test. Your continued support of experiment nights will be greatly appreciated.

These tests will be run in cooperation with the University of Minnesota and several interested Canadian groups. The objective of the program is to place platforms in the north polar region for the monitoring of the earth's electric and magnetic fields remotely via A-O-7 and perhaps other satellites. The data from these platforms should be of particular value to amateurs interested in Sporadic-E and Aurora work as there is a strong correlation between electric and magnetic field activity in the polar regions and VHF band openings. Transmissions will be CW at first but will hopefully be five level (Baudot) RTTY by the end of the test period. Interested in participating in these tests? Contact W3GEY at AMSAT, Box 27, Washington, D.C., 20044.

AMSAT-OSCAR REFERENCE ORBITS AND OPERATING SCHEDULE

AMSAT-OSCAR 6

Period = 114.99449 minutes

Increment = 28.7486 deg/orbit

Inclination = 101.6015 degrees

Operating Schedule

2/10 ON (GMT Days)
EVENINGS
Monday, Thursday, Saturday
MORNINGS
Sunday (EVEN DAYS, Educational demonstrations only)

Note: There will be no regular educational bulletins during July and August.

AMSAT-OSCAR 7

Period = 114.94478 minutes

Increment = 28.7362 deg/orbit

Inclination = 101.7010 degrees

Operating Schedule

EVEN DAYS of year — Mode B
ODD DAYS of year — Mode A
WEDNESDAYS (Experiment and Bulletin use only. General communications not permitted. Days designated below by "X".)

AMSAT-OSCAR 6

REV	DATE		TIME Z	LONG W
12376	JULY	1	0002.2	51.6
12389	JULY	2	0057.1	65.4
12402	JULY	3	0152.0	79.1
12414	JULY	4	0052.0	64.1
12427	JULY	5	0146.9	77.8
12439	JULY	6	0046.8	62.8
12452	JULY	7	0141.8	76.6
12464	JULY	8	0041.7	61.6
12477	JULY	9	0136.6	75.3
12489	JULY	10	0036.5	60.3
12502	JULY	11	0131.5	74.0
12514	JULY	12	0031.4	59.0
12527	JULY	13	0126.3	72.7
12539	JULY	14	0026.3	57.7
12552	JULY	15	0121.2	71.5
12564	JULY	16	0021.1	56.5
12577	JULY	17	0116.1	70.2
12589	JULY	18	0016.0	55.2
12602	JULY	19	0110.9	68.9
12614	JULY	20	0010.9	53.9
12627	JULY	21	0105.8	67.6
12639	JULY	22	0005.7	52.6
12652	JULY	23	0100.7	66.4
12664	JULY	24	0000.6	51.4
12677	JULY	25	0055.5	65.1
12690	JULY	26	0150.5	78.8
12702	JULY	27	0050.4	63.8
12715	JULY	28	0145.3	77.6
12727	JULY	29	0045.3	62.5
12740	JULY	30	0140.2	76.3
12752	JULY	31	0040.1	61.3
12765	AUG	1	0135.0	75.0
12777	AUG	2	0035.0	60.0
12790	AUG	3	0129.9	73.7
12802	AUG	4	0029.8	58.7
12815	AUG	5	0124.8	72.5
12827	AUG	6	0024.7	57.4
12840	AUG	7	0119.6	71.2
12852	AUG	8	0019.6	56.2
12865	AUG	9	0114.5	69.9
12877	AUG	10	0014.4	54.9
12890	AUG	11	0109.4	68.6
12902	AUG	12	0009.3	53.6
12915	AUG	13	0104.2	67.4
12927	AUG	14	0004.2	52.3
12940	AUG	15	0059.1	66.1

AMSAT-OSCAR 7

	REV	DATE		TIME Z	LONG W
B	2848	JULY	1	0023.9	55.8
AX	2861	JULY	2	0118.2	69.3
B	2873	JULY	3	0017.5	54.2
A	2886	JULY	4	0111.8	67.7
B	2898	JULY	5	0011.2	52.6
A	2911	JULY	6	0105.4	66.1
B	2923	JULY	7	0004.8	51.0
A	2936	JULY	8	0059.1	64.5
BX	2949	JULY	9	0153.3	78.1
A	2961	JULY	10	0052.7	62.9
B	2974	JULY	11	0147.0	76.5
A	2986	JULY	12	0046.3	61.4
B	2999	JULY	13	0140.6	74.9
A	3011	JULY	14	0039.9	59.8
B	3024	JULY	15	0134.2	73.3
AX	3036	JULY	16	0033.5	58.2
B	3049	JULY	17	0127.8	71.7
A	3061	JULY	18	0027.2	56.6
B	3074	JULY	19	0121.5	70.1
A	3086	JULY	20	0020.8	55.0
B	3099	JULY	21	0115.1	68.5
A	3111	JULY	22	0014.4	53.4
BX	3124	JULY	23	0108.7	66.9
A	3136	JULY	24	0008.0	51.8
B	3149	JULY	25	0102.3	65.4
A	3161	JULY	26	0001.6	50.2
B	3174	JULY	27	0055.9	63.8
A	3187	JULY	28	0150.2	77.3
B	3199	JULY	29	0049.6	62.2
AX	3212	JULY	30	0143.8	75.7
B	3224	JULY	31	0043.2	60.6
A	3237	AUG	1	0137.5	74.1
B	3249	AUG	2	0036.8	59.0
A	3262	AUG	3	0131.1	72.5
B	3274	AUG	4	0030.4	57.4
A	3287	AUG	5	0124.7	70.9
BX	3299	AUG	6	0024.0	55.8
A	3312	AUG	7	0118.3	69.4
B	3324	AUG	8	0017.7	54.2
A	3337	AUG	9	0111.9	67.8
B	3349	AUG	10	0011.3	52.6
A	3362	AUG	11	0105.6	66.2
B	3374	AUG	12	0004.9	51.0
AX	3387	AUG	13	0059.2	64.6
B	3400	AUG	14	0153.5	78.1
A	3412	AUG	15	0052.8	63.0

SPACECRAFT TRANSPONDER FREQUENCIES

SPACECRAFT	UPLINK	DOWNLINK	BEACON
A-O-6	145.90 - 146.00 MHz	29.45 - 29.55 MHz	29.45 MHz
A-O-7			
(Mode A)	145.85 - 145.95 MHz	29.40 - 29.50 MHz	29.502 MHz
(Mode B/C)	432.125 - 432.175 MHz	145.975 - 145.925 MHz	145.972 MHz
(Mode A/D)	-	-	435.10 MHz

AMSAT-OSCAR 6

REV	DATE	TIME Z	LONG W
12953	AUG 16	0154.0	79.8
12965	AUG 17	0054.0	64.8
12978	AUG 18	0148.9	78.5
12990	AUG 19	0048.8	63.5
13003	AUG 20	0143.7	77.3
13015	AUG 21	0043.7	62.3
13028	AUG 22	0138.6	76.0
13040	AUG 23	0038.5	61.0
13053	AUG 24	0133.5	74.7
13065	AUG 25	0033.4	59.7
13078	AUG 26	0128.3	73.4
13090	AUG 27	0028.3	58.4
13103	AUG 28	0123.2	72.2
13115	AUG 29	0023.1	57.2
13128	AUG 30	0118.1	70.9
13140	AUG 31	0018.0	55.9
13153	SEPT 1	0112.9	69.6
13165	SEPT 2	0012.9	54.6
13178	SEPT 3	0107.8	68.3
13190	SEPT 4	0007.7	53.3
13203	SEPT 5	0102.7	67.1
13215	SEPT 6	0002.6	52.1
13228	SEPT 7	0057.5	65.8
13241	SEPT 8	0152.4	79.5
13253	SEPT 9	0052.4	64.5
13266	SEPT 10	0147.3	78.3
13278	SEPT 11	0047.2	63.2
13291	SEPT 12	0142.2	77.0
13303	SEPT 13	0042.1	62.0
13316	SEPT 14	0137.0	75.7
13328	SEPT 15	0037.0	60.7
13341	SEPT 16	0131.9	74.4
13353	SEPT 17	0031.8	59.4
13366	SEPT 18	0126.8	73.2
13378	SEPT 19	0026.7	58.1
13391	SEPT 20	0121.6	71.9
13403	SEPT 21	0021.6	56.9
13416	SEPT 22	0116.5	70.6
13428	SEPT 23	0016.4	55.6
13441	SEPT 24	0111.4	69.3
13453	SEPT 25	0011.3	54.3
13466	SEPT 26	0106.2	68.1
13478	SEPT 27	0006.2	53.0
13491	SEPT 28	0101.1	66.8
13503	SEPT 29	0001.0	51.8
13516	SEPT 30	0055.9	65.5

AMSAT-OSCAR 7

	REV	DATE	TIME Z	LONG W
B	3425	AUG 16	0147.1	76.5
A	3437	AUG 17	0046.4	61.4
B	3450	AUG 18	0140.7	74.9
A	3462	AUG 19	0040.0	59.8
BX	3475	AUG 20	0134.3	73.4
A	3487	AUG 21	0033.7	58.2
B	3500	AUG 22	0127.9	71.8
A	3512	AUG 23	0027.3	56.6
B	3525	AUG 24	0121.6	70.2
A	3537	AUG 25	0020.9	55.0
B	3550	AUG 26	0115.2	68.6
AX	3562	AUG 27	0014.5	53.4
B	3575	AUG 28	0108.8	67.0
A	3587	AUG 29	0008.1	51.8
B	3600	AUG 30	0102.4	65.4
A	3612	AUG 31	0001.8	50.2
B	3625	SEPT 1	0056.0	63.8
A	3638	SEPT 2	0150.3	77.4
BX	3650	SEPT 3	0049.7	62.2
A	3663	SEPT 4	0143.9	75.8
B	3675	SEPT 5	0043.3	60.6
A	3688	SEPT 6	0137.6	74.2
B	3700	SEPT 7	0036.9	59.0
A	3713	SEPT 8	0131.2	72.6
B	3725	SEPT 9	0030.5	57.4
AX	3738	SEPT 10	0124.8	71.0
B	3750	SEPT 11	0024.1	55.8
A	3763	SEPT 12	0118.4	69.4
B	3775	SEPT 13	0017.8	54.2
A	3788	SEPT 14	0112.0	67.8
B	3800	SEPT 15	0011.4	52.6
A	3813	SEPT 16	0105.7	66.2
BX	3825	SEPT 17	0005.0	51.0
A	3838	SEPT 18	0059.3	64.6
B	3851	SEPT 19	0153.6	78.2
A	3863	SEPT 20	0052.9	63.0
B	3876	SEPT 21	0147.2	76.6
A	3888	SEPT 22	0046.5	61.4
B	3901	SEPT 23	0140.8	75.0
AX	3913	SEPT 24	0040.1	59.8
B	3926	SEPT 25	0134.4	73.4
A	3938	SEPT 26	0033.8	58.2
B	3951	SEPT 27	0128.1	71.8
A	3963	SEPT 28	0027.4	56.6
B	3976	SEPT 29	0121.7	70.2
A	3988	SEPT 30	0021.0	55.0

MINUTES OF THE BOARD OF DIRECTORS MEETING

March 20, 1975

The AMSAT Board of Directors met at the Goddard Space Flight Center at 8:30 PM with the attendees of the International AMSAT-OSCAR Experimenters Conference which was convening to discuss the Phase III spacecraft program. The following were in attendance:

P. Klein, K3JTE	T. Clark, WA3LND	D. Hull, VK3ZDH
J. King, W3GEY	L. Kayser, VE3QB	R. Pepper, VE2A0
W. Dunkerley, WA2INB	R. Daniels, WA4DGU	R. Kolbly, K6HIJ
W. Tynan, W3KMV	R. Carpenter, W30TC	C. Swedblom, WA6EXV
C. Dorian, W3JPT	K. Meinzer, DJ4ZC	J. Kasser, G3ZCZ/W3

Perry Klein K3JTE introduced the attendees, and made a presentation on the status of efforts to obtain permission from the F.C.C. to conduct limited experiments using the 2304.1 MHz beacon aboard AMSAT-OSCAR 7. The major difficulty in obtaining this permission is of a political nature - the effect on amateur relations in various countries and the forthcoming 1979 ITU World Administrative Radio Conference.

The meeting was turned over to representatives of the International Experimenters Conference, who spoke on the future Phase III satellites and the responsibilities of each group toward developing these spacecraft. Specific areas discussed were:

1. Possible program approaches.
2. Possible launch vehicles and opportunities for Phase III spacecraft.
3. Launch vehicle tradeoffs.
4. AMSAT philosophy in the past.
5. Follow-on philosophy.
6. Documentation.
7. Follow-on AMSAT-OSCAR program approach.
8. Summary of proposed responsibilities.

At the conclusion of the presentation, Joe Kasser G3ZCZ/W3 outlined a proposed new recognition award for communications via OSCAR satellites. It was agreed that the award working group would have authority to reach a final decision of the format and requirements for a certificate, taking into account the views of the representatives from Australia, Canada and Germany.

The meeting adjourned at 12:30 AM.

Charles Dorian W3JPT
Secretary

(Continued from Page 3)

fabrication of command generating and telemetry decoding equipment, and the development of the software required to program the spacecraft microcomputer. AMSAT Hdq. will prepare the Phase III spacecraft specifications, and coordinate the activities of the engineering, fabrication and ground system equipment groups. This includes the tasks of obtaining space-qualified hardware, such as integrated circuits, transistors, nickel-cadmium batteries, solar cells, a suitable spacecraft boost motor, and arranging the launch and licensing. The San Bernardino Microwave Society representatives discussed the desire to develop a new, higher power 2304 MHz beacon for the Phase III project, a beacon that may play an important role during the launch phase in determining the spacecraft orientation before firing of the boost motor.

It is expected that there will be a Phase III design review around the end of the year when the basic design and breadboard work should be completed. The schedule calls for the completion of the engineering test model of the spacecraft by November 1976, and the completion of fabrication of the flight spacecraft one year later, followed by six months of pre-flight testing. This schedule is predicated on the basis of a mid-1978 launch opportunity, the view being expressed that it would be highly desirable to have the Phase III spacecraft in orbit and operating well in advance of the 1979 World Administrative Radio Conference.

AMSAT-OSCAR QSL BUREAU

Dennis Grinerod, WA1EHF, 288 Grand St., Bridgeport, Conn. 06604, is serving as U.S. AMSAT QSL Manager in the following manner:

(a) All users to send him several SASE's which will be filled by incoming cards and mailed when full.

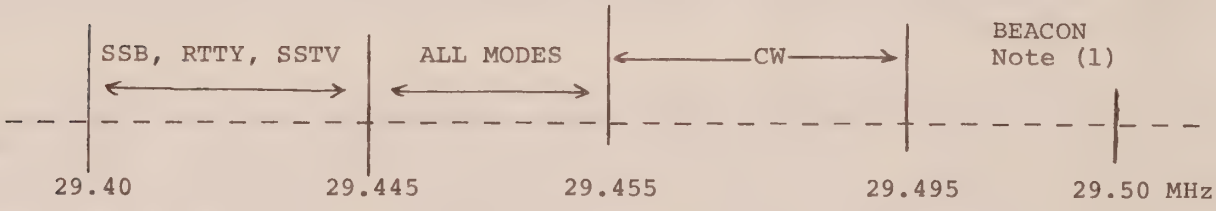
(b) DX - QSL's incoming and outgoing: Outgoing cards will be forwarded at a rate of 6¢ per card or 20 cards for a dollar.

(c) Domestic - QSL's: Send him your U.S. and Canadian cards in bulk. These will be sorted and placed in the SASE's.

TABLE OF ANTENNA POLARIZATIONS FOR AMSAT-OSCAR 7

SYSTEM	POLARIZATION IN NORTHERN HEMISPHERE	POLARIZATION IN SOUTHERN HEMISPHERE
2/10 Transponder uplink	Left-hand circular	Right-hand circular
2/10 Transponder downlink	Linear	Linear
70/2 Transponder uplink	Right-hand circular	Left-hand circular
70/2 Transponder downlink	Right-hand circular	Left-hand circular
435.1 MHz beacon	Left-hand circular	Right-hand circular
2304.1 MHz beacon	Right-hand circular	(antenna shielded from Earth)

AMSAT-OSCAR 7 2/10 TRANSPONDER BANDPLAN DOWNLINK FREQUENCIES



NOTES:

(1) Guard Channel to avoid interference at any Doppler shift.

(2) SSB use USB for uplink.

(3) Recommend. ERP = 100 watts.

These stickers are printed in black on a fluorescent red background. They are pressure sensitive and will stick to anything including QSL cards and envelopes.

AMSAT

They come in sheets of 48 and may be obtained from David Middleton, W7ZC, Box 203, Springdale, Utah 84767, for only $1.25 postpaid.

(Be the first in your call area to have stuck-up QSL cards . . . .ed)

AMSAT General Meeting

March 22, 1975

The meeting was called to order at 8:30 PM at the NASA Goddard Recreation Center, Greenbelt, Maryland. This meeting was co-sponsored by the Goddard Amateur Radio Club with Tom Clark, WA3LND presiding.

The meeting opened with the drawing of door prizes. This was followed by the presentation of the solar panel covers from AMSAT-OSCAR 7 to the Australis, AMSAT-Canada, AMSAT-Deutschland, and San Bernardino Microwave Society representatives, VK3ZDH, VE3QB, DJ4ZC, K6HIJ and WA6EXV. Recognition was given to Werner Haas DJ5KQ for his efforts in the AMSAT-OSCAR 7 project, and wishes were expressed for his early recovery from his automobile accident. George Jacobs W3ASK, on behalf of CQ Magazine, made an award of the October 1974 CQ original cover portrait to Jan King W3GEY.

At this time, reports were received from WIA Project Australis, AMSAT-Canada, AMSAT-Deutschland and the San Bernardino Microwave Society.

Project Manager Jan King W3GEY advised on the following:

1. AMSAT-OSCAR 6 is now in its third year of operation, and its future appears to be limited only by progressive radiation damage to the COS/MOS integrated circuits.

2. The AGC in AMSAT-OSCAR 7's two-to-ten meter transponder is set to inhibit the use of excessive earth station EIRP. If every user would stay within the 100 watt EIRP limitation, there should be no problem with reduced satellite transmitter power.

3. There is a need for experiments and public service projects for the AMSAT-OSCAR 7 experiment days on Wednesdays.

4. The AMSAT Phase III spacecraft would be a long-lived, inclined elliptical orbit satellite system having a very high apogee for improved long-distance communications.

In conclusion, Jan expressed thanks to everyone for their support in the AMSAT-OSCAR 6 and 7 activities, and requested support for the future Phase III project.

ARRL Vice-President Vic Clark W4KFC presented greetings from President Harry Dannals W2TUK, and expressed his regret at not being able to be present due to other commitments. Vic announced that the ARRL Technical Merit Award has been given to Karl Meinzer DJ4ZC and Werner Haas DJ5KQ for 1974, for their contributions to the AMSAT-OSCAR 7 satellite.

Bill Dunkerley WA2INB made a presentation on the activities of educators in making use of the OSCAR satellites. He strongly recommended that two-to-ten meter transponders be available in future satellites on a continuing basis for these educational programs. He was supported by the ARRL Vice-President in these comments. Bill advised there was to be a teacher workshop on OSCAR satellite uses at the NASA Goddard Space Flight Center in May 1975. There is great value in explaining space to the public.

Recognition was given to the efforts of Dick Daniels WA4DGU for his many efforts and in particular, his construction of the two-to-ten meter transponders in AMSAT-OSCAR 6 and 7. The services of Dave Mills W3HCF in his analysis and reduction of AMSAT-OSCAR 7 telemetry data by computer was also noted.

Art Feller W4ART provided some background on the problem of authorizing the use of the 2304 MHz beacon on AMSAT-OSCAR 7.

Recognition was given to the many long hours provided by Perry Klein K3JTE in the work on AMSAT-OSCAR's 6 and 7, as well as his outstanding guidance over the past years.

In conclusion, the attendees expressed thanks to the Goddard Amateur Radio Club for arranging the meeting and the earlier tour of the Goddard facilities and steak dinner.

The meeting adjourned at 11:00 PM.

Charles Dorian W3JPT
Secretary

MINUTES OF THE BOARD OF DIRECTORS MEETING APRIL 20, 1975

by Bob Carpenter, W3OTC
Acting for the Secretary

The meeting was called to order at 8:25 PM at the Goddard Space Flight Center by the President, K3JTE. In attendance were:

Perry Klein, K3JTE	Bob Carpenter, W3OTC	Bill Dunkerley, WA2INB*
Jan King, W3GEY	Bill Hook, W3QBC	Harry Yoneda, JA1ANG
Tom Clark, WA3LND	Joe Kasser, G3ZCZ	

(*via telephone)

On motion of Tom Clark, it was decided to hold the AMSAT Annual Meeting at the ARRL National Convention at Reston, Va., Sunday morning, September 14, 1975.

Ted Vogel, HB9OP, was appointed AMSAT Coordinator for Switzerland and France.

It was decided to establish an award for an outstanding student project involving amateur satellites. This award would be named as a memorial to "Cap" Petry, W3AWN. An approach will be made to the Foundation for Amateur Radio (Washington, D.C.), toward possibly jointly sponsoring and administering this award.

It was proposed to establish AMSAT Area Coordinators in each of the U.S. call areas as local contact points for information dissemination, information on how to get on the satellites, orbital data, and the general answering of questions. The President will contact possible appointees.

There was a discussion, without decision, on whether to continue turning AMSAT-OSCAR 6 on for reference orbits.

An AMSAT-OSCAR 7 pin was presented to Harry Yoneda, JA1ANG in recognition of his services as AMSAT Coordinator for Japan and Southeast Asia.

The price of individual issues of the "AMSAT Newsletter" (including back issues) was raised to $1.00 each.

It was agreed to make AMSAT-OSCAR orbit calendars for 1976 available free to new AMSAT Life Members.

The meeting concluded at 9:50 PM, and was followed by informal discussions with JA1ANG, visiting from the Japan AMSAT Association.

RADIO SOCIETY OF KENYA REPORT

About twelve hams are getting together a set of 2m transmitters and are going to start to get on the air with a local net.

There is a Rose Bowl Cup, called the JEREMY AWARD, that will be awarded to the first person in Kenya to secure a 2 m contact with someone outside of the African Continent. There are two of these cups and one will be given to the local ham and the other will be given to the person that makes the contact from outside of the continent. The method is by any means, moon bounce, OSCAR 7, direct, or bouncing it off of your shoe, if that will work.

Peter Peham, 5Z4JJ has succeeded in getting a signal into OSCAR 7 but due to the fact that no one was listening at his lower freq, he got no reply as yet. We did copy him here on the 10 m link.

5Z4PO has the equipment but lacks the proper crystal to get into OSCAR 7, but soon.... PO is Al Woodward.

As we do get more activity, I shall let you know.

R. Geary, Hon. Secretary

AMSAT-OSCAR 7 SLIDE COLLECTIONS

Slide collections covering the construction, test and launch of AMSAT-OSCAR 7 are now available. These sets of 21 slides, complete with detailed slide descriptions, may be ordered for $5.00 postpaid (or 28 IRC's) from Norman Chalfin, K6PGX, P. O. Box 463, Pasadena, Calif. 91102. Make payments payable to Norman Chalfin. All excess procees over costs will go to AMSAT.

AMSAT-OSCAR 7 Slide Titles:

1. WA4DGU constructing the two-to-ten meter transponder.
2. Two-to-ten meter transponder before encapsulation.
3. 70cm-to-2m transponder receiver.
4. 70cm-to-2m transponder transmitter.
5. 70cm-to-2m transponder modulator.
6. Command decoder.
7. Wiring harness.
8. Spacecraft interior.
9. Spacecraft with solar panels in place.
10. 435.1 MHz beacon transmitter.
11. Morse code telemetry encoder.
12. Experiment control logic.
13. Battery charge regulator.
14. Nickel-cadmium battery.
15. Hybrid/diplexer module.
16. K3JTE, K6GSJ, W5CAY, DJ4ZC, K6HIJ, VK3ZPI and W3GEY at Experimenters Meeting.
17. Vibration test.
18. Installation in the Delta launch vehicle.
19. Spacecraft after installation in launch vehicle.
20. Launch!
21. Figure "7" drawn in the sky following launch.

OSCAR SATELLITE COMMUNICATIONS ACHIEVEMENT RECOGNITION

NEW SATELLITE OPERATING AWARD

AMSAT is going to hand out OSCARs. AMSAT announces a new operating award for satellite users, details as follows:

PURPOSE -- The purpose of the award is to stimulate and maintain a continuing interest in satellite communications by providing recognition of continuing QSO accomplishments, AND to provide for recognition by AMSAT of special efforts and services by all radio amateurs.

AVAILABILITY -- The basic award is available for confirmed satellite contacts with either (1) 20 US states, Canadian call areas or countries, or a mixture thereof, or (2) six Australian call areas and two countries, or (3) any other requirements as specified by the AMSAT Board of Directors.

NOTES -- (1) All contacts made via any OSCAR spacecraft using any legal transmission mode are valid.

(2) QSL cards or other written confirmation of contacts must show that the qso was via a satellite.

(3) In lieu of such qsl cards, applicants may submit a list of contacts confirmed by the awards manager of their national amateur radio society or AMSAT affiliate organization.

(4) All contacts must be made from the same qth (within an area of 25 miles from a particular location).

(5) Sufficient postage must be supplied for the return of the qsl cards sent. The award is free to AMSAT members, and is available to nonmembers for the nominal fee of $1.00.

(6) Endorsements will be available for each ten (10) additional areas as defined in section (1) above.

(7) Send applications to AMSAT-Award Program, Box 27, Washington, D.C. 20044, U.S.A.

THE USE OF OSCAR SATELLITES FOR DIRECT SATELLITE-HOME BROADCAST TRANSMISSION

According to the AMSAT appeal to use the OSCAR satellites for direct satellite-home broadcast transmission we should like to recommend to organize a series of broadcast testsin the European area.

It is a well-known fact that the spectrum for AM broadcasting /LF-MF-HF bands/ is very crowded. One of the most interesting thing from the point of view of the broadcasters is the better spectrum utilization. From this point of view the A3H /SSB/FC/ would be a suitable one which was tested for MF broadcasting in some tests organized by the E.B.U., European Broadcasting Union.

Recommendation

1. It would be very useful to organize tests by the 146/29 MHz satellite systems to investigate the suitability of the A3H mode for satellite-home broadcast. The lack of the selective fading in the satellite-ground path ensures good reception by envelope demodulators, too, and A3H uses only the half bandwidth of the A3 mode.

The tests will give us new results which will be very great help in the preparations for the 1979 WARC.

2. The O-7 432/146 MHz system is suitable to illustrate the FM mode for satellite broadcasting, F3 mode, with 15 kHz peak deviation and with Doppler correction is a suitable configuration for test transmission.

If the IARU Region 1 Conference agrees MRAS is ready to organize the broadcast tests. The IARU Region 1 Headquarters could arrange some free orbits on Wednesdays, for test by the AMSAT.

Dr. A. Gschwindt
HA5WH

Presented at the Region 1 Division Conference of the International Amateur Radio Union.

WASHINGTON SATELLITE AWARD RULES

1. The W.S.A. Satellite Award is available to any licensed amateur in the world.
2. State side/VE stations must contact five (5) Washington stations via an amateur satellite using any permitted mode of operation.
3. DX stations must contact any three (3) Washington stations.
4. Only contacts made after March 1, 1974, will qualify for the award.
5. An application will consist of the QSL cards accompanied by a fee of $1.00 if cards are to be returned.
6. There is a certificate for both Oscar 6 contacts and Oscar 7 contacts.
7. Send cards and fee to: Committee Chairman, Tim Blair, WA7FVT, P. O. Box 2262, Tacoma, Washington 98401.

This award is designed primarily to develop an interest in Washington State in Amateur Satellite Communications.

"LETTERS AND COMMENTS"

Dear OMS:

Success at last! After eighteen months of trying to get up on OSCAR despite money problems, parts problems and my own head space, have heard myself through OSCAR VI this morning. Am now using the Johnson 6N2 powered with the Ranger into two element 2m quad tilted back 30 degrees; receiving with Swan 500C and TA33 at 45 feet.

I have OSCAR printed on my QSL cards and am anxious to put the circle around that on a few hundred of them. Thanks to many AMSAT members on the air and through the mail who gave advice and encouragement. Crystals at 145.916 and 145.959, using the former the most. No set schedule except as often as possible.

73,
Dave Roberts
KZ5IT/WAØZQO

Hi,

The OSCAR bug has bitten! I spent this weekend reviving a Hammarlund HQ-160 so I could check out the 10 meter downlink signals from OSCAR 6 and 7.

Last night after copying the latest orbital data from W1AW I tried for the first time to catch OSCAR. On OSCAR 6 orbit 11,200 I heard 6Y5SR and WB4KGV in a CW QSO. Both were good solid signals well above the noise. This was at 0156 4-6-75 UTC. At about 0157 I heard W1NU request all stations to QRT, making reference to this being a "reference orbit." His transmission was SSB and was perfectly readable. 6Y5SR then called W1NU several times and then the band went dead. I heard several other carriers and QSO;s during this pass, but was unable to copy any other calls. On orbit 11,201 at approximately 0351 I did not hear anything. We were experiencing very heavy static making reception impossible.

I'm hooked!

Within the next month or two I plan to be active through 6 and 7 mode A. My plans call for CW and SSB. In the next few days I plan to have a pre-amp in front of the HQ-160 as well as a better antenna -- currently I'm using a long wire.

Thanks and 73,
Jim K9EIV

Dear Sirs:

I have written several programs for the HP-65 calculator which may be of interest to various AMSAT members or users.

1. Program to calculate equator crossing times for both satellites. This will only display crossings of line-of-sight interest for the location in question, or can be fixed to display all crossings.

2. Program to give the latitude and longitude (referenced to an equator crossing) of the satellite for any time (referenced to the same equator crossing). This program assumes a circular orbit.

3. Program to give Az-El data for any ground station location, given the satellite latitude and longitude and height (all distance units km).

The first program is on two cards (or both sides of one card) and the other two are on one card each. The third is in the HP library as number 1737A. I am willing to supply listings and (if cards are supplied) programmed cards. Please supply SASE (business size) and cards if desired. The second program may sometimes be modified to handle an elliptical orbit, but this is not really important for OSCAR 6 or 7 unless you are measuring doppler to a few cycles.

73,
Pete Carah, K6JRR
229-21st Street
Santa Monica,
CA 90402

It is distressing to me to learn that my QSL replies are not getting through. Especially so, when I have been extremely conscientious in over 40 years of hamming to answer all QSLs.

Of course, I now realize that utilizing the World QSL Bureau in Calif. is just no good, at least, to route my U.S. cards. Almost everyone I work wants my QSL which is very understandable with little VE5 CW activity. Consequently, in view of increased postal rates, I have to utilize some bureau since the bulk of cards are for the U.S.A.

In future, I will be sending all U.S. OSCAR replies via WA1EHF in lots of twenty.

(Continued on Page 25)

The reason I am outlining this, is in the hope that possibly you can pass this word along to anyone you may encounter who has not received my QSL reply. Unfortunately I have no way of knowing which cards didn't get through, so anyone not receiving my card, could possibly file their call with you and be passed to me on 14280 Sun-net (or send me a postcard).

I am unable to hear the 75 mtr nets and limited to Sun 14280 irregularly due to often working on Sundays.

Chasing EU DX here is great sport as we have about a 1-2 min. window to the continent and a little longer for West and Northwest EU (E1 GM SM etc.).

Am looking forward to the disappearance of snow and winter in order to once again try some diff. ants. for both 2 and 10. Have also acquired a surplus GE450 mHz unit but as yet no feedback heard on 2 -- need more gain in ant. I presume.

Would appreciate if you could publicize QSL situation for me. I don't like to be considered a delinquent.

Thanks and 73,
Gordon, VE5XU

Gentlemen:

Charles Panek WA2NTI and Stan Rogacki WA2EXX, engineering students at Stevens Institute of Technology, have computer programs available which will generate satellite orbital data for both AMSAT-OSCAR 6 and AMSAT-OSCAR 7. The programs are written in FORTRAN-4, and list time, day, date, orbit number and degrees west orbital longitude. Copies of any or both of these programs are available upon receipt of a business size stamped and addressed envelope (SASE). The address is: Stan Rogacki, WA2EXX, 136 Manhattan Ave., Waldwick, N.J., 07463. We would be interested in hearing about satellite programs from other AMSAT members.

Thank you very much,
73,
Stan, WA2EXX

Please spread the word on the AMSAT QSL Buro. I'm snowed under and would like to get back to tracking/building/432. Since S.C. is rare I keep a running index and will try to give all active stations 1 QSO on 6 and 7 at least. -- Then resume building. However I must use a Buro or either direct returns on received QSLs. I do spread what info I have to three other areas of S.C. -- so hopefully others can take load off just QSO and QSL S.C. W4GCB and self will try to acquire a 432 Xmtr to put S.C. on there. I am here on OSCAR for tracking, building and experimenting but we will try to give reasonable time to confirming S.C. and getting others basic info.

Dave, WA4LBO

While I am sure we all regret the necessity of the increase in dues for AMSAT membership, I am surprised AMSAT was able to hold out so long before taking such action, in view of well-known inflationary pressures. I think AMSAT has been performing an indispensable service to amateur radio and I believe the proposed $10 annual membership dues is not excessive.

As for the alleged hardship this may impose on foreign hams, one must also consider the substantial drop in the value of the Dollar in relation to other currencies over the past few years in evaluating the extent of the "real" increase for many such hams. For example, when I arrived in Austria in 1971, the Dollar was worth about 25 Austrian Schillings (AS), and today it is worth about AS 16.50, or 34% less.

Putting this in terms of AMSAT membership, in 1971 it would have cost an Austrian AS 125 per year, whereas with the increase after July 1, 1975, it will cost him only AS 40 more, or AS 165 at today's rate of exchange. This is only about a 32% increase, compared with the 100% increase it will cost U.S. hams. While it should be recognized that this variation will differ for other countries, it is a factor that should not be overlooked.

Sincerely,
Thomas G. Gabbert
OE1ZGA/K3NZV

Dear Editor,

I am in absolute agreement with OM Joe Kasser G3ZCZ in regard to the increase of subscription. The earning capacity and living conditions are so different, a common scale appears to be of unequal load on hams of different countries.

The fact that additional expenditure is involved in providing improved OSCAR's and other services to hams is indisputable. "We can't have the cake and eat that too." But the economic situations in developing and in underdeveloped countries are such that these hams cannot but have a "piggy-back" ride. The best contribution may be made in their own currency which may only be of use to cover up the local activities and encourage the future generation. (Sending equivalent money in dollars is not easy.) Whatever the benefit derived from AMSAT activities may be taken as the generous contribution of AMSAT and its members for the world of tomorrow.

VU2UV had been the lonely station in this area for quite a few years. VU2QQ had a short operational life (Jan., Feb., 1974).

VU2RM (Rad, Kakinada) and VU2KX (Susil, West Bengal) are the two new stations in the VU2 horizon, and active from Feb., 1975, on 2/10 meters. These stations put up a strong signal and are active on all possible ascending nodes in this region between 250-310°W. The location is suitable for QSO's with Europe, USSR, Japan and other South East Asian countries.

VU2UV operates both modes A and B and is reported having slight chirp in mode B. VU2UV uses 15 W (Varactor multiplier) on 432 MHz feeding a 10 + 10 element 'J' beam (home brew) and has worked JA6AHB, JA2AAT, OH2RK, ZE7JX, UG6AD, RA9MBN, UR2EQ, DK6ASA and SP9DH. The antenna for the 2 meter receiver is a 4 turn helical (home brew). The valve type converter feeds SX28 and this arrangement still requires improvement. Both antennas are remotely controlled in Azimuth/Elevation.

The obstacle in the way of VU2 hams to walk over to OSCAR operation is the nonavailability of sensitive receivers/converters/VHF solid state devices for home brewing of gear. Hope, as the years pass by, we may hear more VU2 calls through OSCARS.

More than a year ago, I wrote to AMSAT about an abnormal reception of OSCAR 6 signals on 10 meters when the spacecraft was over Canada. The matter was clarified by OM Ray, K2QBW as selective skip (his letter dated 11/22/73). Ever since that time, I have been able to copy some extended propagation on 10 m. of OSCAR 6 and 7 signals. The details of signals received are given in the reverse. I have tried to plot the OSCAR's path on the map and surprisingly, the area falls over Indo-China and the abnormal propagation is limited to a particular area. The drop in the signal strength is about 3 dB less than the normal and more often than not, the same strength. Though my observation has been limited to a single QTH, the presence of the abnormality, limited to a narrow longitude is interesting. I have watched for similar effects in other areas and have never been able to observe such abnormalities.

I would like other hams to note these facts and am willing to help or receive help to study further this characteristic. Hope you may publish these facts in AMSAT Newsletter or any other suitable magazine.

73,
Suby, VU2UV

Dear Joe,

Here's an item for the next AMSAT Newsletter:

A program written for the Hewlett-Packard programmable calculator (HP-65) is available for computing both azimuthal and elevation coordinates for either OSCAR 6 or 7. The satellite and individual QTH data are input once and the AZ-EL coordinates are then computed for either ascending or descending nodes. The program can be stored on a single HP-65 magnetic card. Documented copies of the program will be forwarded upon receipt of a blank magnetic card and s.a.s.e.

73,
Earl Skelton
WA3THD
1901 Deerfield Ct.
Washington, D.C.
20021

Dear President,

Looking in the last issue of "Amsat Newsletter" at Joe Kasser's thoughts about the overseas members renewal's dues: here are some statistics.

In Italy, the USA Dollar is now worth about L640, at the Bank for small amounts; so, Amsat's renewal now costs me L3,200, and, in the future years, shall be costing me L6,400.

At the same time, the renewal for ARI's membership is L7,000, plus L7,000 for Pescara's ARI membership, and about the same for other Italian Clubs.

Other data: renewal dues for TCI (Touring Club Italiano) are now L7,200, per year, for Italian Members; one issue of the most popular magazine "CQ Elettronica", costs L1,000, the other amateur magazines vary between L700 and L1,500.

An average Italian salary is L4,000,000 per year. An apartment house, in Pescara, costs about L1,000,000 per year.

On March 29, I mailed my life Membership Application Form to AMSAT. Dear President, my old member's number, LM-370, I'd like to use as Life Member. I consider this a good luck wish for AMSAT and also for me!

Excuse my poor English, but I haven't, I think, a good Shakespeare's friend!

My best wishes for Amsat's future activities!

Sincerely yours,
Lorenzo Cerrato
I6FTR

Dear Editor,

I think its about time that AMSAT crack down on the users of OSCAR 6 & 7 having poor signals, ie SSB that's firing, chirp, Tl notes on CW, splatter, etc. Best we police ourselves before the FCC, DOC, etc. decide to do it. I would think that AMSAT Washington would pay closer attention to things that might "upset" the FCC when asking for waivers etc.

Maybe we should get the ARRL "OO's" to get satellite "orientated".

73,
Randy, VE2BYG

Dear Joe,

I am interested in hearing from anybody that has FAX uplink capability, and would be interested in running OSCAR-FAX experiments with me. I have OSCAR-FAX downlink capabilities for the OSCAR 6 or 7 2/10 meter transponder.

Jerry Robinson, III, WB4TNB
107 Norwood Avenue
Asheville, N. C. 28804

Thank you 73',
Jerry

CLASSIFIED

These messages are published as a service to members at no cost on a space available basis. Deadline for next issue is 1 August, 1975.

Gonset Sidewinder, two meter SSB Transceiver, $150.00 ---- W6OAL

Heath SB-500, two meter transverter, $125.00 ---- KH6IHP

Collins 62S-1, two meter transverter, $575.00 ---- W6BBI

Johnson 6N2, two meter Tx, 75W out used on both S/C, with Xtal 145.920 MHz and self contained 110V. psu. $100.00 ---- WB4UOX (703-860-1389)

HP-65 Calculator Programs, Calculate Equatorial Crossings, Az-El, etc. Send SASE and two cards to K6JRR.

ANNOUNCEMENT OF AMSAT ANNUAL MEETING

The seventh AMSAT Annual Meeting will be held at 11:00 AM on Sunday morning, September 14, 1975, at the Sheraton International Conference Center, Reston, Virginia. The meeting this year is being scheduled in conjunction with the 1975 ARRL National Convention at Reston that weekend.

In accordance with the AMSAT Bylaws, ballots for the election of four Directors and two Alternate Directors will be counted at this meeting. The terms of the following Directors will be expiring as of this meeting: Charles Dorian W3JPT, Jan King W3GEY, Perry Klein K3JTE, and William Tynan W3KMV. (Please be sure to return your mail ballot for Directors enclosed in this issue of the "AMSAT Newsletter," to reach us in time for the meeting.)

The agenda will include:

Introductions

AMSAT Annual Report

AMSAT-OSCAR 6 and AMSAT-OSCAR 7 Progress Report

Report on the AMSAT Phase III Program

Report on Results of the Election of Directors

Other Business

Members coming from out of town are invited to let us know your plans, as we are often able to arrange for members to be hosted by Washington area AMSAT members.

Your official ballot for the election of directors for 1975-1977 is at the bottom of the page. Four directors are to be elected in odd numbered years in accordance with Article IV, Section 2 of the bylaws. The nominations of the candidates on the ballot have been submitted to the Secretary by an Authorized Officer of a Member Society in accordance with Article V, Section 2.

Ballots will be counted at the annual general meeting, Sunday, September 14, 1975, by tellers appointed by the president.

PLEASE VOTE

Please fill in the ballot below -- now -- and mail it today. (If you would prefer not to tear it out of your Newsletter, write your choices on a blank slip of paper.) Place your ballot in a plain envelope and mail it in a second envelope which has your name and membership number on the outside. This information is needed to validate your ballot.

BALLOT

Select four (4) from the following list of nominations:

Name	Check	Call	
Charles Dorian	☐	W3JPT	Washington, D.C.
Jan A. King	☐	W3GEY	Lanham, Md.
Perry I. Klein	☐	K3JTE	Washington, D.C.
Peter H. Shavney	☐	WA30VH	Glenside, Pa.
William A. Tynan	☐	W3KMV	Silver Spring, Md.
William Webster	☐	WB2TNC	Seabrook, Md.
David A. Clingerman	☐	W60AL	Oak View, Ca.

Mail to AMSAT, P. O. Box 27, Washington, D. C. 20044, USA, to reach us no later than September 13, 1975.

1975 Candidates to the AMSAT Board of Directors

David A. Clingerman, W6OAL

Dave Clingerman, W6OAL, has been with the U.S. Navy for the past eighteen years, where he is program manager and satellite communications engineer for airborne systems at the Pacific Missile Range, Point Mugu, California. An avid OSCAR user with over 12,000 QSO's and several OSCAR awards to his credit (including OSCAR-WAS), he also lays claim to the first aeronautical mobile, maritime mobile, and trans-Pacific mobile-to-mobile operation via OSCAR 6. He has been serving as AMSAT-OSCAR 6 command station for the West Coast and Eastern Pacific for the past two years. He was also instrumental in final checkout and preparations of AMSAT-OSCAR 7 for launch at the Western Test Range.

Charles Dorian, W3JPT

Charles Dorian, W3JPT, Capt., U.S.C.G. (Ret.), is Manager, Maritime Planning at COMSAT General Corp. in Washington, D.C., where he is involved in the planning of applications and the international aspects of the MARISAT satellite system and its commercial development. He was formerly Assistant Director, Office of Telecommunications in the U.S. Dept. of Transportation, and was also formerly Chief of Communications in the U.S. Coast Guard. He is past president of the Foundation for Amateur Radio, and is Assistant Director for Space Communications of the Atlantic Division of the ARRL. He has served as Secretary of AMSAT and a member of the Board of Directors since 1969.

Jan A. King, W3GEY

Jan King, W3GEY, is an Aerospace Technologist in the Delta Project Office at the NASA Goddard Space Flight Center, Greenbelt, Md., where he is a spacecraft coordinator. He has served as a director and Executive Vice President of AMSAT since 1969, and was AMSAT's Project Manager for Australis-OSCAR 5, AMSAT-OSCAR 6, and AMSAT-OSCAR 7. In this capacity, he coordinated a team of several dozen persons involved in construction, testing, and launch preparations. He is the author of a number of technical articles on OSCAR's 5, 6, and 7 for the IEEE, the ARRL Technical Symposium, and QST.

Perry I. Klein, K3JTE

Perry Klein, K3JTE, has been with AMSAT fulltime since 1973. He was previously an engineer with the technical staff at the Communications Satellite Corporation and COMSAT Labs, Clarksburg, Md., where he was a founder, station trustee, and past president of the COMSAT Amateur Radio Club. He has served as a director and President of AMSAT since its formation in 1969, and has been actively involved in all facets of AMSAT's activities.

Peter H. Shavney, WA3OVH

Peter Shavney, WA3OVH, is Trustee and Board Chairman of the Pennsylvania Amateur Radio Club, Glenside, Pa. A statistician involved in the insurance field, he is corresponding secretary and contest chairman of the Bicentennial AR Convention Committee. He has been active in the retransmission of AMSAT-OSCAR orbital bulletins on teletype for those living in the Eastern Pennsylvania and Central New Jersey areas.

William A. Tynan, W3KMV

William Tynan, W3KMV, is a Senior Engineer at the Applied Physics Laboratory of the Johns Hopkins University, Silver Spring, Md., where he has been involved with interface management and system documentation. He is Technical Editor of Forecast Magazine, and is also a Contributing Editor responsible for "The World Above 50 Mc." column in QST. He is a founder and was first president of the APL Amateur Radio Club. He is also past president of the Rensselaer Polytechnic Institute Amateur Radio Club and the National Capital VHF Society. He has served as a member of AMSAT's Board of Directors since 1969 and Vice President - Operations for several years, in which position he has been responsible for AMSAT's nets and telecommand stations. He is station trustee of AMSAT's net control station, W3ZM, and of AMSAT's Washington area FM repeater, WR3ABU.

(Continued on page 30)

(Candidates Continued from Page 29)

WILLIAM J. WEBSTER, JR., WB2TNC

Dr. William Webster, WB2TNC, is a member of the scientific staff of the Geophysics Branch at the NASA Goddard Space Flight Center, Greenbelt, Md., where he is a professional radio astronomer. He is active with the Goddard Amateur Radio Club, where he conducts classes in amateur radio. He is an active user of both AMSAT-OSCAR 6 and 7, and assisted with launch day communications from the Goddard Club station, WA3NAN during the launch of both of these satellites. He also has been serving occasionally as net control station of the east coast AMSAT net.

THE SAN MARINO DX-PEDITION by "Pete" I5TDJ

Luciano, I5FLN and I went to San Marino, as guests of M1C, M1D and M1I, taking our solid-state rig which worked very well. Unfortunately, the operation site, M1I's house, was screened from 270° to 0° by Titeno Hill, the hill that San Marino is located on, so we were unable to work the VE and W stations that we heard. For the other directions there were no nearby hills, and we succeeded in working VU2UV with the satellite at 0° elevation.

The San Marino boys were very friendly, and Ivo, M1I's XYL, was very patient during her house 'invasion' !

Tony, M1C, is interested in joining the satellite users ranks, and intends to build some VHF gear for this purpose (at present there is no VHF gear whatsoever in San Marino). I shall be helping, and thus should get a chance to work San Marino myself in the future!

Operations were made under the M1C call on Saturday 4 January, and under M1I on Sunday 5 January, and the following were worked:

4 January, M1C. OSCAR 7 - Mode 'B' 432/145 MHz. Orbit 627: I1TEX, F9FT, DJ2RE, I5ARS, all 2xCW. OSCAR 6 - Orbit 10158: CN8BO (2xSSB), I5ARS, G3IOR, I5CTE, all 2xCW.

5 January, M1I. (No OSCAR 6 QSO;s as it was off all orbits) OSCAR 7 - Mode 'A' 145/29 MHz. Orbit 635: G8GP, OH2RK, G3IOR all 2xCW, G3IOR (2xSSB), OK1BMW (2xCW) Orbit 639: VU2UV (2xCW), I5CTE (2xSSB), OK3ØCDI, OK3ØBDS, OH2RK, G3IOR, ON4DY, G3PEJ, all 2xCW.

The rig used was 40w. CW/SSB on 145/29; varactor tripler, 20w. out for 70 cm. Rx: Solid state with 145 MHz. converter; Antennas: 10 el. Yagi for 432 MHz. (vertically mounted) - 2 x 5 el. crossed Yagis for 145 MHz. - 2 el. quad for 29 MHz. (M1I's).

I did not find much of a "pile-up" - my feeling is that many satellite users prefer to stay on one frequency and call "CQ", perhaps a behaviour common to VHF men. Several stations called CQ on our frequency and did not get our call when we answered them - bad Rx's or local noise?

QSL's for M1C go via his QSL manager I4EAT. M1I's go via IØBNZ. We greatly enjoyed the mild pleasant Wx, and visiting the town. I believe you know the place if you have been on holiday on the Adriatic Sea - will send you some pictures that we took when they are available following processing.

The famous "Murphey's Law" hit us, but not on the radio equipment. On the trip back to Florence on the Bologna - Florence autostrada, the oil pressure lamp came on the car, and we were towed by an emergency vehicle off the expressway to have it fixed in 15 minutes at a repair shop. Five kilometres from Florence, we stopped again, when my homemade electronic ignition system blew out after seven years of faithful service. We arrived back home from the 220 Km. trip after four and a half hours!

OSCAR News, March 1975

AMSAT GRATEFULLY ACKNOWLEDGES DONATIONS OF $50.00 OR MORE FROM THE FOLLOWING NEW LIFE MEMBERS

LM-210 Stig Sandell, SM5BOF
LM-211 M. J. Sparrow, G8ACB/G6KQJ
LM-212 Katsuhiko Fukasaka, JR3CDE
LM-213 Kimo Maegawa, JA9BOM
LM-214 Martin M. Grey, WA2DAB/WA3YNR
LM-215 T. G. Gabbert, OE1ZGA/K3NZV
LM-216 Dr. D. J. Manson, KØTVO
LM-217 John H. Thompson, W1BIM
LM-218 E. Neal, G8GP
LM-219 J. Heywood, G8BHQ
LM-220 T. T. Paatero, OH2RK
LM-221 Howard D. Rawls, WA4FZR
LM-222 Stan Burghardt, WØIT
LM-223 Cleyon O. Yowell, WB6EHT
LM-224 William W. Daniels, K3SDO
LM-225 P. J. A. Gowen, G3IOR
LM-226 Tony Bailey, G3WPO
LM-227 P. Watson, G3PEJ
LM-228 J. Banes, WA7YIG
LM-229 C. R. Fadden, WA2LNU
LM-230 George C. Drysdale, Jr., WA6ALQ
LM-231 Masamitsu Kobayashi, JA1EMX
LM-232 Dr. H. Junqueira, PY2SU
LM-233 Leonard M. Butsch, Jr., K4CNP
LM-234 Bernhard M. Bloom, K3KZB/4
LM-235 Olof Karlsson, SM6PU
LM-236 Eberhard Fischer, DC6QP
LM-237 Dr. Morton Jacobs, KØEPJ
LM-238 Ian T. Ashley, ZL1AOX
LM-239 William F. Costello, KV4GQ/MM
LM-240 Vikton Kudielka, OE1VKW
LM-241 Karl-Juergen Protze, DL7KK
LM-242 H. W. Hall, Jr., K5FPJ
LM-243 Robert D. Scott, G6TS
LM-244 M. C. Board, WA8WOQ
LM-245 Leonard Foss, W9OTW
LM-246 George R. Thurner, W8FWG
LM-247 Edward S. Clammer, W3UN
LM-248 George Roach, VE3BNO
LM-249 Palmer E. A. Back, WB6QLY
LM-250 Harry M. Dannals, W2TUK
LM-251 Robert F. Dannals, WB2UZU
LM-252 G. E. Boswell, VE6AOE
LM-253 P. Preben-Hansen, OZ1RM
LM-254 C. E. Williamson, VE3TW
LM-255 Miroslav Bogosavljev, YU1SJ
LM-256 Aleksandar Piosijan, YU1NAJ
LM-257 Colin Hurst, VK5HI
LM-258 Jean-Marie Polard, ON4EU
LM-259 Walter Isaacson, VE6ANI/VE8ARS
LM-260 Tex Kennedy, W5QDB
LM-261 Charles H. Scholten, W9BZU
LM-262 Dr. Jack Hammett, K4VV
LM-263 Douglas M. Butcher, VE1AAV
LM-264 Richard E. Lee, K4BAP
LM-265 Frank H. Nelson, K4JUB
LM-266 Roy T. Tucker, K6UZB
LM-267 Gregory Roberts, ZS1BI
LM-268 Bronius M. Davis, WA1IGV
LM-269 Alec Steingart, WB2MZE
LM-270 Jaime Sarmiento, HK7ASC

AMSAT GRATEFULLY ACKNOWLEDGES DONATIONS FROM THE FOLLOWING NEW LIFE MEMBER SOCIETIES

LMS-7 Baltimore Amateur Radio Club, Baltimore, Maryland
LMS-8 AMSAT Mexico, Mexico, D.F., Mexico
LMS-9 Highland Park High School Amateur Radio Club, Highland Park, Illinois

ARRL NATIONAL CONVENTION -- RESTON

SATURDAY, SEPTEMBER 13 -- 1300 TO 1530

SPACE COMMUNICATIONS & EME FORUM

ORGANIZER -- TOM CLARK WA3LND/WØ1UF

Will include presentations on A-O-6 and 7 stutus, Classroom Education with Amateur Satellites, Phase III Report, Presentations on the VHF/UHF/Microwave Recommendations for the FCC's 1979 WARC position, and other topics of interest to satellite users and serious VHF operators.

FROM THE DEPARTMENT OF INFORMATION AND PUBLICITY

AMSAT Area Coordinators

For local help, information and any other material relating to the AMSAT-OSCAR program, contact your local area representative listed below.

Overseas area representatives are required. If you have been active in AMSAT-OSCAR and are interested in becoming an area coordinator in your country and there is no AMSAT affiliate organization in your country contact the AMSAT Department of Publicity and Information.

Dennis Grinerod, WA1EHF, 288 Grand Street, Bridgeport, Conn. 06604
Bob Crumrine, WB2DNN, 24 Parkmere Road, Rochester, N.Y. 14617 (716)342-0479
Fred Merry, W2GN, 35 Highland Drive, East Greenbush, N.Y. 12061 (518)477-4990
Ed Bizub, WA2CBB, 1579 Franklin Street, Clark, N.J. 07066
Kaz Deskur, K2ZRO, P. O. Box 11, Endicott, N.Y. 13760
Glenn Kurzenknabe, K3SWZ, 403 Centerview Ave., New Cumberland, Pa. 17070
Ted Mathewson, W4FJ, 1525 Sunset Lane, Richmond, Va. 23221 (703)355-5118
Walter Dixon, W4DWN, 820 N.E. 123rd St., Miami, Fla. 33161 (305)895-0398
Mark Calderazzo, WB4UOK, 6257 Luzon Drive, Orlando, Florida 32809
William Appleby, WB5DCY, 28 Linda Lane, Long Beach, Miss. 39560
Steve Hay, K5RZU, 11010 Strait Lane, Dallas, Texas 75229 (214)361-1860
Bud Schultz, W6CG, 3050 Ball Road, #154, Anaheim, Calif. 92804 (714)826-4850
John Barboe, K7VNU, Rt. 4, Box 1157, Bequim, Washington 98382
Richard Cotton, W8DX, 5526 Buckingham Road, Detroit, Mich. 48224
Joe Schroeder, W9JUV, Box 406, Glenview, Ill. 60025 (312)724-8816
Jim McKim, WØCY, 1404 South 10th, Salina, Kansas 67401
Katashi Nose, KH6IJ, 4207 Huanui Street, Honolulu, Hawaii 96816

AMSAT
P.O. Box 27
Washington, D.C. 20044
RETURN POSTAGE GUARANTEED

SECOND-CLASS
POSTAGE PAID AT
WASHINGTON, D.C.